DOCUMENT RESUME

ED 200 139 HE 013 624

TITLE Informing the Future: A Plan for Higher Education for the Eighties. Working Papers.
INSTITUTION Texas Coll. and Univ. System, Austin. Coordinating Board.
PUB DATE Jan 81
NOTE 209p.; For related document, see HE 013 623.
AVAILABLE FROM Coordinating Board, Texas College and University System, P.O. Box 12788, Capital Station, Austin, TX 78711.

EDRS PRICE MF01/PC09 Plus Postage.
DESCRIPTORS Allied Health Occupations Education; Campus Planning; Collective Bargaining; College Faculty; *College Planning; Community Colleges; *Educational Finance; Educational Research; Educational Technology; Energy Conservation; Financial Support; *Futures (of Society); General Education; *Higher Education; Leadership; Private Colleges; Public Support; School Demography; State Aid; State Colleges; *Statewide Planning; Tax Allocation; Tenure; Urban Universities; Vocational Education; Water Resources
IDENTIFIERS *Texas

ABSTRACT

Major issues affecting higher education in Texas in the 1980s are identified in 20 working papers from outside consultants, the academic community, and Texas College and University System Coordinating Board staff. Topics and authors include: higher education in Texas in the 1980s (Christopher Dede); leadership in higher education (Joseph Kauffman); education for the future (John D. Moseley); media and technology (John E. Fryman); faculty tenure (William R. Keast); the importance of research (H. Eldon Sutton); collective bargaining (Milden J. Fox, Jr.); state support of higher education (John Harris); independent higher education in Texas (Charles H. Oestreich); potential impacts of water resources on higher education in Texas (Robert M. Sweazy, Lloyd V. Urban, and George A. Whetstone); significant issues confronting Texas higher education (William R. Johnson); issues influencing the future of urban institutions of higher education (Charles E. Bishop); health professional education (Edward N. Brandt, Jr.); community college funding (Jean Richardson); public community college program development and evolvement in the 1980s (Robert L. Clinton); investment in higher education; balance between general and vocational education (Doris Burbank); public higher education finance; statewide planning for campus construction; and energy resources. (LB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

INFORMING THE FUTURE

A Plan for Higher Education for the Eighties

ED200139

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

WORKING PAPERS

PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Texas Coordinating Board

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

HE 011 362 4

Coordinating Board • Texas College and University System

INFORMING THE FUTURE

A Plan for Higher Education for the Eighties

WORKING PAPERS

January 1981

Coordinating Board, Texas College and University System
P.O. Box 12788, Capitol Station
Telephone (512) 475-4361, Austin, Texas 78711

FOREWORD

This companion volume to "Informing the Future: A Plan for Higher Education for the Eighties" contains papers on a variety of topics relating to the development and coordination of Texas higher education in the next decade. In order to bring a broad perspective to our planning efforts, we sought background papers from a number of nationally distinguished educators, and some of their reports are included in Part I of this document. The Coordinating Board expresses its appreciation for their thoughtful contributions to our planning process.

Viewpoints of the various sectors of the academic community are presented in Part II. It contains testimony from representatives of public junior and senior colleges, independent higher education and faculty associations presented at the June 19, 1980, meeting of the Board. We are grateful for the comments and suggestions received from all of these groups.

Part III is devoted to supplementary staff papers which explore in greater depth several of the issues discussed in the long-range plan itself.

Kenneth H. Ashworth
Commissioner of Higher Education

COORDINATING BOARD, TEXAS COLLEGE AND UNIVERSITY SYSTEM

Beryl Buckley Milburn, Chairman, Austin (1981)

Tom B. Rhodes, Vice Chairman, Dallas (1985)

Charles C. Butt
Corpus Christi (1983)

Harlan Crow
Dallas (1981)

Hal Daugherty, Jr.
El Paso (1985)

Marshall Formby
Plainview (1983)

Newton Gresham
Houston (1983)

R.F. Juedeman
Odessa (1985)

Gwendolyn C. Morrison
Fort Worth (1985)

Robert H. Park
Houston (1983)

L.F. Peterson
Fort Worth (1981)

Mario E. Ramirez, M.D.
Rio Grande City (1985)

Herbert G. Schiff
Dallas (1985)

Ralph Spence
Tyler (1981)

Paul Teague
Texas City (1981)

Wayne E. Thomas
Hereford (1983)

M. Harvey Weil
Corpus Christi (1983)

Sam D. Young
El Paso (1981)

Note: Six-year terms of all Coordinating Board members expire on August 31 of years indicated.

STAFF ADMINISTRATIVE OFFICERS

Kenneth H. Ashworth, Commissioner of Higher Education

William A. Webb, Deputy Commissioner
Head, Division of Financial Planning

Mack C. Adams
Assistant Commissioner for
Student Services

Gordon Flack
Assistant Commissioner for Campus
Planning and Facilities Development

Norma R. Foreman
Assistant Commissioner for Senior
Colleges and Universities

Dean Finley Herbst
Assistant Commissioner for
Health Affairs

David T. Kelly
Assistant Commissioner for Community
Colleges and Continuing Education

James McWhorter
Assistant Commissioner for
Administration

TABLE OF CONTENTS

Foreword..... iii

Consultants' Reports to the Board..... 1

About the Contributors..... 3

Higher Education in Texas: Issues in the 1980s
Christopher Dede..... 5
Leadership in Higher Education
Joseph F. Kauffman..... 29
Education for the Future
John D. Moseley..... 41
Media and Technology in the '80s
John E. Fryman..... 57
Faculty Tenure in the 1980s: Problems and Opportunities
William R. Keast..... 71
Research: Its Importance for Texas Universities and for the State of Texas
H. Eldon Sutton..... 85
Collective Bargaining in Texas Higher Education in the 1980s
Milden J. Fox, Jr. 95
State Support of Higher Education
John Harris..... 107
Independent Higher Education in Texas--1980
Charles H. Oestreich..... 123
Potential Impacts of Water Resources on Higher Education in Texas
Robert M. Sweazy, Lloyd V. Urban and George A. Whetstone. 143

Testimony from the Academic Community..... 153

Significant Issues Confronting Higher Education in Texas in the 1980s
William R. Johnson..... 155
Issues Influencing the Future of Urban Institutions of Higher Education
Charles E. Bishop..... 165
Health Professional Education in the 1980s
Edward N. Brandt, Jr., M.D. 169
Community College Funding Concerns
Jean Richardson..... 173
Public Community College Programs: Development and Evolvement for the '80s
Robert L. Clinton..... 179
Higher Education: An Investment, Not a Cost..... 185
The Balance Between General and Vocational Education
Doris Burbank..... 189

Staff Working Papers..... 191

Public Higher Education Finance..... 193
Statewide Planning for Campus Construction..... 205
Energy Resources..... 211

PART I

Consultants' Reports to the Board

ABOUT THE CONTRIBUTORS

CHRISTOPHER DEDE is an associate professor at the University of Houston at Clear Lake City. He has been at the vanguard of the future studies movement and co-chairs the Futures Research Committee, which he initiated, at UH-CLC. At the time he prepared his paper for the Coordinating Board, he was a policy fellow in the planning office of the National Institute of Education in Washington, D.C. He is president of the education section of the World Future Society and co-author of the The Far Side of the Future (World Future Society, 1978). His research interests include the future of education and the future of technology. He received the bachelor of science degree from the California Institute of Technology and the doctor of education degree from the University of Massachusetts.

MILDEN J. FOX, JR., is a professor of industrial engineering at Texas A&M University and a labor relations arbitrator. He is the author of numerous articles dealing with labor arbitration and collective bargaining and serves as coordinator of labor relations courses at Texas A&M. After receiving the bachelor of science and the master of science degrees from Oklahoma A&M University, he was employed in private industry for more than 15 years until receiving his doctorate from Texas A&M University in 1969. He is a member of the Advisory Service Panel of the National Research Council.

JOHN FRYMAN is the owner of a media production and consultant firm in Austin with expertise in the application of media to educational problems. His more than 25 years of experience in the visual arts include employment as a producer at KLRN-TV in Austin and teaching positions in broadcasting at the University of Wyoming and The University of Texas at Austin. He conducted graduate research in videotape technology and its use in education, receiving his doctoral degree from the University of Texas, where he also earned bachelor of fine arts and master of science degrees.

JOHN HARRIS is a professor of education at Middle Tennessee State University. Editor of The American University: Some Dilemmas and Alternatives (1970), he has published several articles dealing with curriculum innovation and nontraditional education. He has held a variety of administrative positions in higher education, serving most recently as the assistant director for academic affairs for the Tennessee Higher Education Commission. Harris received the bachelor of arts degree from David Lipscomb College in Nashville, master of education degree from the University of North Carolina at Chapel Hill and doctor of education degree from the University of Tennessee.

JOSEPH F. KAUFFMAN, executive vice president of the University of Wisconsin System, is a professor of educational administration and was formerly head of the doctoral program in college and university administration at the Madison campus. He was president of and has held other administrative positions with Brandeis University. He is the author of several books in the field of higher education; his most recent is At the Pleasure of the Board: The Service of the College and University President

(American Council on Education, 1980). He received the bachelor of arts degree from the University of Denver, the master of arts degree from Northwestern University and his doctorate from Boston University.

WILLIAM R. KEAST served as chairman of the national Commission on Academic Tenure in Higher Education. The former president of Wayne State University, he also has served in faculty and administrative positions at the University of Texas at Austin, Cornell University and the University of Chicago. A specialist in 17th and 18th century English literature, he is the author of several books and articles on prose, poetry and criticism. Keast received AB and PhD degrees from the University of Chicago and an LLD degree from the University of Michigan.

JOHN MOSELEY is chancellor of Austin College, after having served as its president from 1953 to 1978. He is a member of the Board of Directors of the National Association of Independent Colleges and Universities, former chairman of the Association of American Colleges and a past president of the Association of Texas Colleges and Universities and the Independent Colleges and Universities of Texas, Inc. He also serves as the executive director for the Center for Program and Institutional Renewal at Austin College. Moseley holds a bachelor of science degree from East Texas State University, a master of arts degree and a doctor of jurisprudence degree from The University of Texas at Austin.

CHARLES H. OESTREICH is the president of Texas Lutheran College. He joined TLC as academic dean in 1969, after serving on the faculty of Virginia Military Institute, Ohio University and Capital University. He received the bachelor of science degree from Capital University, and the master of science and PhD degrees from Ohio University. Oestreich is a member of the Board of Directors of the Council for the Advancement of Small Colleges, chairman of the President's Advisory Council of the Small College Consortium and a director of the Texas Independent College Fund.

ELDON SUTTON is a former vice president for research at The University of Texas at Austin, where he currently serves as a professor of zoology. He holds three degrees from UT Austin, including a PhD in biochemistry. A former president and member of the Board of Directors of the American Society of Human Genetics, he has published several books and numerous articles in that field. He also was editor of the American Journal of Human Genetics. Sutton has served as scientific consultant to several organizations, including the National Institute of Occupational Safety and Health and the American Cancer Society.

ROBERT M. SWEAZY is the director of the Water Resource Center and a professor of civil engineering at Texas Tech University. He is the vice chairman of the Water Resources Board of the City of Lubbock. Sweazy has published several articles dealing with water reuse and water utilization in dry areas, and co-authored a presentation to the World Congress on Water Resources in Mexico City in 1979. He received the bachelor of arts and master of science degrees from Wichita State University and a PhD degree from the University of Oklahoma.

HIGHER EDUCATION IN TEXAS: ISSUES IN THE 1980s

by Christopher Dede

Historically, higher education has been slow to change and relatively unaffected by major shifts in its societal context. Hence, policy-makers have not used anticipatory long-range planning as a major tool in decision-making. The 1980s, however, appear to be a particularly unstable period for America, with changes coming that will have sweeping implications for Texas colleges and universities. This paper outlines the likely alternative futures which higher education may face in the next decade and presents suggestions for development of a strategic planning capability in response.

The future resembles a tree: the trunk is unitary, as is the present; the many branches are the different alternative futures. As we walk up the trunk toward the branches (through the present into the future), each choice we make cuts off a branch (removes an alternative option). By the time we get to the location of the branches (by the time the present becomes the future), only one branch is left (the new present) and again a host of alternative futures stretches out before us.

The major demographic, technological, economic and political branches of the future of Texas higher education are discussed below. Some of these sectors are almost completely predetermined; here, potential responses are limited to different reactive options. Other prospective developments can be shaped if educational policy-makers anticipate them; suggestions are present for how higher education might accomplish this. Such an approach provides a method of planning for all probable contingencies, assigning resources on the basis of relative likelihood and desirability.

Shifts in Student Population

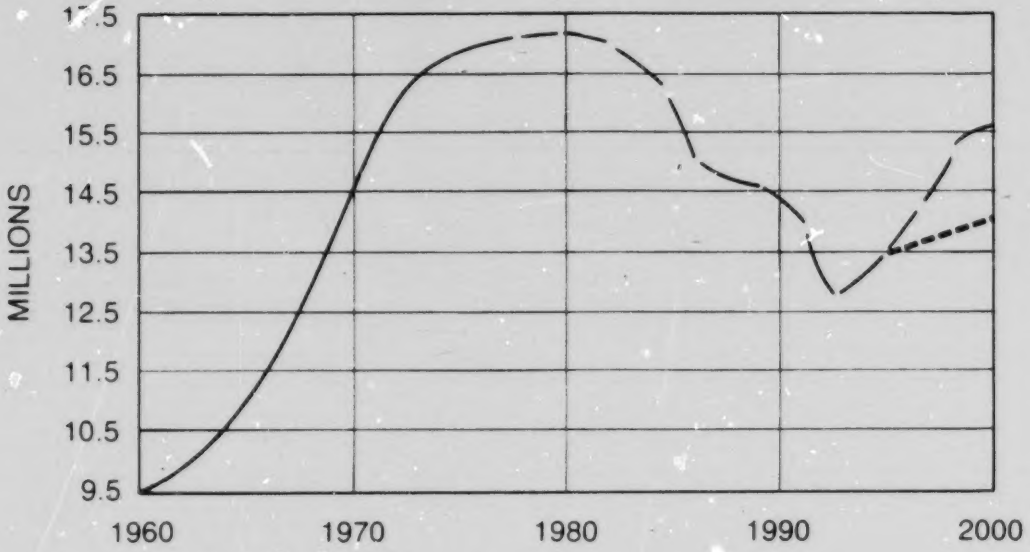
Demographic trends will have a major impact on Texas higher education in the 1980s. Change will occur in the number of students, the mix of different age groups in the student population, the geographic distribution of educational demand and the special needs students bring to the learning environment. In turn, these shifts will have major implications for enrollment projections, the proportionate demand for different types of courses, and the management of growth and decline in postsecondary institutions.

Changes in the Age Structure of the Population

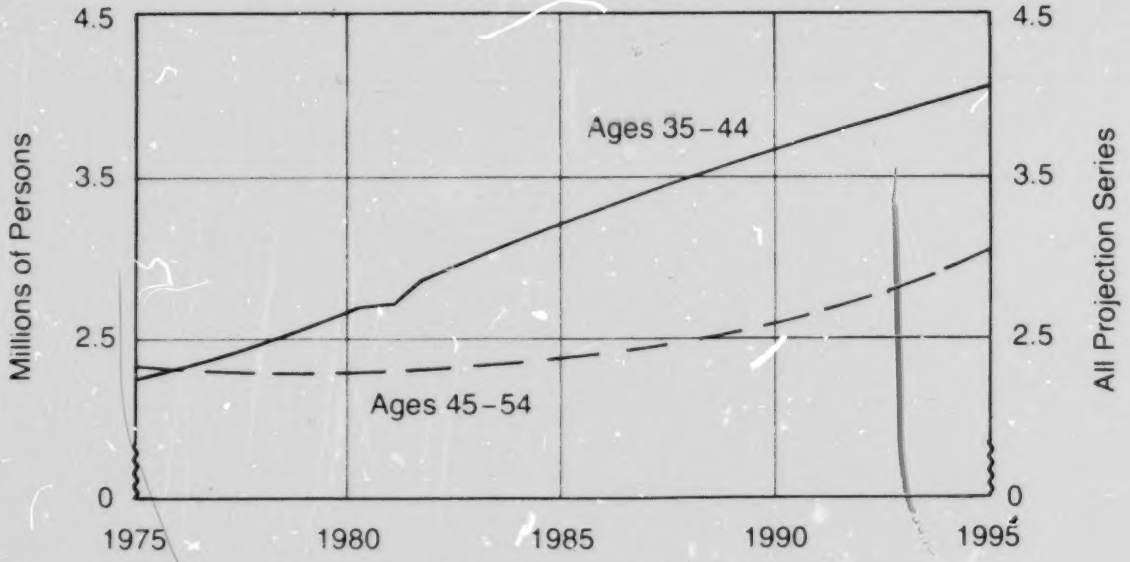
Between 1980 and 1990, the population aged 18-24 in the United States will decrease by 2.6 million, a decline of 15 percent. This decrease follows a long period of growth caused by the "baby boom" after World War II. The "baby bust" generation of the 1960s is now beginning to enter colleges and universities. This will significantly affect attendance since 48 percent of the total enrollment in higher education (and 64 percent of the undergraduate enrollment) in 1975 came from this age cohort.

During the 1980s, the number of adults aged 35 and over will increase.

NUMBER OF 18-TO-21-YEAR-OLDS, 1960–2000[1]



ADULT POPULATION, AGED 35–54, 1975–1995[2]



Moreover, the proportion of adults seeking higher education may grow. Because of economic change, needs for career mobility and rapid technological developments affecting job skills, many adults will seek formal occupational retraining. (One census sample found that one-third of American adults surveyed had changed occupations in the past five years.) There is also a growing demand for informal adult education, stemming in part from a desire for a balanced mix or education, work and leisure throughout the lifespan.[3]

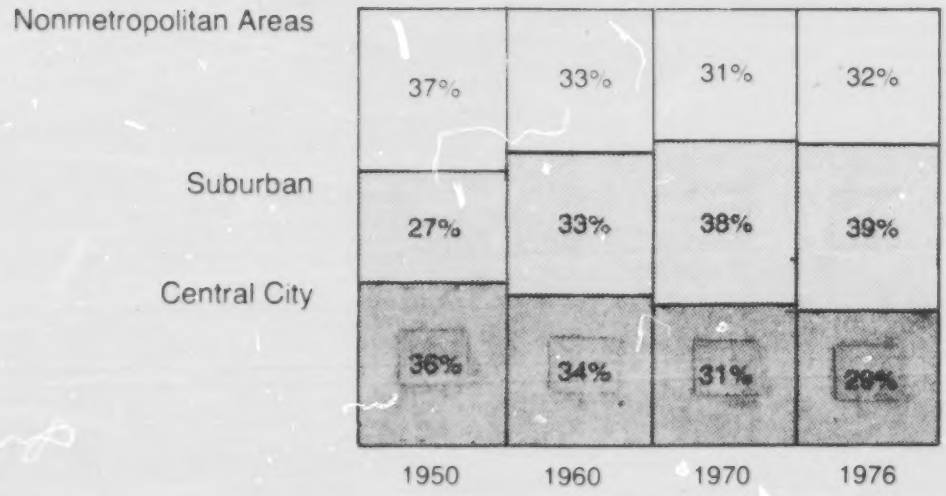
Ultimately, the impact of these two changes in population size on Texas higher education is uncertain. Since college attendance is not mandatory, a potential loss of enrollment can be counteracted if a larger percentage of adults is recruited as students. A recent American Council on Education study lists 12 ways to achieve such increases, including raising high school graduation rates, cutting attrition among current students and enrolling students who now take courses from industrial employers.[4]

Geographic Distribution of Educational Demand

General figures on population size are less useful to colleges and universities than disaggregated data on demographic shifts in their own enrollment region. The deviations among different states from average U.S. population figures can be quite large. For example, the American Council on Education projects that, from 1975-1985 the 18-year-old population will drop by 50 percent in Rhode Island and 44 percent in the District of Columbia, while rising 32 percent in Nevada and 26 percent in North Carolina. Even such statewide figures are too general for detailed planning; county by county net migration patterns would be more useful, especially in a rapidly growing state such as Texas.

Some overall trends in geographic distribution can be noted. Sunbelt states are experiencing net population in-migration. In the 1980s, Texas' average annual population growth is projected to be 1.48 percent (15th among the states).

PERCENT DISTRIBUTION OF POPULATION BY METROPOLITAN AND NONMETROPOLITAN RESIDENCE, 1950-1974[5]



Central cities are declining in size, while suburban and nonmetropolitan areas are growing. In general, publicly supported institutions located near large suburban areas, structured to accommodate part-time students, with healthy graduate enrollments and an environment attractive to foreign and nonwhite students will be relatively more prosperous than four-year private colleges located in rural areas and totally dependent on full-time boarding students.

Special Needs of Students

Part-time students have different educational needs than the traditional postsecondary student population (and generally are more expensive for colleges and universities to service). Since 1970, part-time enrollment has increased from 32 percent to 40 percent of total enrollment and is expected to continue growing. Certainly, if higher education attracts more adults in the 35-and-over age cohort, the historical model of instruction geared to full-time, on-campus students will shift toward increasingly flexible, decentralized and nonformal activities.

The number of foreign students seeking admission to Texas colleges and universities may be substantial. In 1976-77, over 200,000 foreign nonimmigrants attended American academic institutions (how much this will change as international tensions increase is uncertain). These students--usually men majoring in engineering, business management and the sciences--have special language and cultural needs which pose extra burdens for higher education.

Two factors which have very great implications for elementary and secondary education in the 1980s may also affect colleges and universities. First, households are likely to become smaller and less traditional; by 1985, only about 40 percent of the population will be living in families of three or more persons. Many more young women will be childless, unmarried, working. Separation, divorce and remarriage are all increasing. Use of childcare is becoming routine as a greater number of families have two wage-earners. Potentially, higher education could offer services to help adults adjust to these changing cultural patterns.

Second, low income and minority students are increasingly becoming concentrated in the central cities. Projections show white populations in the core of large cities decreasing by up to 27 percent from 1970 to the year 2000, while nonwhite populations increase by up to 85 percent. Also, large numbers of non-English speaking hispanic and Asian immigrants are migrating to urban areas. Legal immigrants recently have averaged four million per decade in the United States, while illegal immigrants are today estimated at between two and 12 million people. It is likely that by the end of the 1980s hispanics will be the largest minority group in the country.

Nationwide, the proportion of adults aged 18-24 who are from minority groups will increase from 15.3 percent in 1980 to 17.9 percent in 1990. To the extent that these students attend college, they will require special instructional services.

Summary

Demographic changes are relatively predictable events, yet educators

have historically failed to plan for these shifts and have encountered major difficulties in consequence. The management of growth and decline will be a crucial area for Texas higher education in the 1980s, and anticipatory planning is needed. For example, one strategy for campuses with falling enrollments would be to make a smooth transition to smaller budgets, decreased personnel and a reduced physical plant. An alternative strategy might be to redirect the mission of the institution toward providing new client groups with additional services (such as university-industry "partnerships for productivity"). Policy analyses of the relative costs and benefits of such options need to be done far in advance of actual enrollment declines.

Emerging Developments in Educational Technology

In the past several years, major strides have been made in producing different types of versatile, low-cost hardware for instructional technology. Lack of high-quality software has slowed application of these new educational devices, and little is known about their potential for improving the learning process and the classroom environment. Five promising technologies currently under development are briefly described below, with a sense of their perceived costs and benefits for higher education.

Educational Television. Programs such as "Sesame Street" have demonstrated the potential of television to improve basic skills such as reading in young children. Presumably, comparable instructional programs could be produced for students of all ages, including adults. These would be delivered either to classrooms or to homes on the multiple cable-television channels that will soon be nearly universal in Texas.

Of course, these shows require sophisticated equipment, a large capital investment and a carefully sequenced script drawing on insights from motivational and developmental psychology. Thus, production of high quality programs would necessitate a statewide commitment to achieve a large enough potential audience for cost effectiveness.

Such a supplement to standard educational practice could save a great deal of repetitive rote instruction, and much of the time faculty currently devote to teaching "Introduction to..," courses could be redirected. If programs were broadcast to extra-campus settings, a portion of the money now spent on transportation and facilities maintenance would also be saved. Should such broadcasts reach a wider audience, the state would benefit from previously undereducated adults becoming more capable of coping with laws, bureaucracies, banks and citizenship responsibilities.

One major problem in initiating such a technological system lies in the difficulty of raising the initial resources to create the complex organization that would produce, distribute and promote these educational television programs. Also, considerable time might elapse before most students were accustomed to seek out this means of instruction and use it to its full potential. Finally, care would need to be taken to avoid the mistakes of early educational television programs which ignored motivational psychology and were consequently extremely boring.

Hand-held Computers. A second emerging instructional technology would use

portable microprocessors to do semi-sophisticated computer-assisted instruction. The instructional modes that can be programmed on these inexpensive, powerful devices include tutorial approaches (computer presents simple material, asks questions to determine proper assimilation and corrects misunderstandings), inquiry approaches (student asks for a specific fact; computer responds with appropriate data), dialogue (student asks a general question; computer responds with a complex answer) and explanation/interpretation (computer presents complex learning material and responds to general questions). Tutorial might be used, for example, to teach portions of history; inquiry, to obtain data for an assigned paper on demographics; dialogue, to explain recent changes in federal tax structure; and explanation/interpretation, to outline the implications of a new law regulating capital investment.

If this technology were to be implemented, many different types of software could be produced, distributed and programmed into hand-held computers as needed. Large-scale costs for both equipment and programming would be quite low. Implications for teaching would be that standard "read-and-ask-questions" education could be made uniform (at enormous savings of faculty time) and that many library and textbook functions could be programmed into computers (yielding further savings).

Fiscal costs would be small, but a major human cost would be that information transfer will become very depersonalized. Even a well-programmed computer cannot behave as could a human being. Further, standardization and uniformity carry risks: one mistake in a program means that every student in the state learns the same error, one bias in content results in all students' attitudes being malformed. Quality control must be very rigorous if such an instructional system is to be used.

"Artificial Intelligence" Simulations. A third learning device which could be implemented is based on using a large central computer to deliver to television sets multiple person, interactive, "artificial intelligence" based simulations. Many of these simulations will resemble games but will be much more sophisticated than the relatively simple computer games sold in stores. For example, learners will not be limited to a small range of responses; any response given to the computer will trigger an appropriate message in return. This feature allows much greater emphasis to be placed on creativity and on higher order cognitive skills. Also, the opportunity to interact with other human "players," with the computer mediating, makes this approach much less depersonalized than traditional computer-assisted instruction. Input to the computer (which can handle multiple simulations simultaneously) would be typed on a keyboard; in 10 years, spoken input may be possible as well. Natural language (rather than computer language) is used.

An example of such an instructional approach might be a "corporate management" simulation for students in a graduate business course: seven learners; approximate total time, 35 hours (spread out over a period of several weeks). Each learner would act as a particular officer in the corporation, with given duties to perform and several obstacles to master. Emphasis might be placed on development of accounting skills, team problem-solving, data gathering and synthesis activities, computer programming skills, and information management abilities (including interaction with others through a telecommunications device). Preliminary research on these technological simulations shows that they are intensely motivating and interesting without depending on novelty factors to hold student interest.

What are the implications of such instruction? Some (but not all) of higher order skill development in colleges and universities could be decentralized; personnel, travel and facilities costs would be reduced. Students' abilities to program and use machines would be enhanced; simultaneously, graduates would be prepared for a work environment increasingly oriented toward technological skills and abilities. Developmental costs will be extremely high; currently, artificial intelligence software can require up to 10,000 hours of programmer time for each hour of instructional time produced. As with instructional television, these high production costs would require a statewide client audience for cost-effectiveness. However, once the learning simulation is developed, the use costs are negligible, and the game can be replayed indefinitely by a whole series of learners. Over a long period of time, using simulations such as this, faculty instruction could be greatly reduced in most training-oriented subjects (that is, subjects in which there is a limited range of right answers to questions). Such an approach might be very attractive for university-industry collaborative efforts.

Videodisk Programs. A fourth instructional technology stems from coupling videodisk programming to an interactive microcomputer. In this manner, filmed material can be presented and, based on individualized learner response, be tailored to maximize efficiency of instruction. An example might be a marketing situation in which the learner is the sales representative in a potential client's office; based on the responses of the student to each statement by the client, appropriate new material is presented. This technology would provide a more limited response range and slightly fewer variations than provided with the "pure" computer simulations described earlier (because of the enormous cost of filming to handle unusual responses that learners might make). However, the learning experience would be more personal and concrete, less abstract and symbolic.

Current videodisk and microcomputer technology is sufficient to create such programming; production costs are enormous, but use costs would be very small. Over a very long period of time, enough programs of this type could be developed to substitute for many group teaching situations, but could not replace human teaching in the development of very high levels of cognitive or affective skills or in specialized areas in which small client populations would reduce cost effectiveness.

Information Management Technologies. A fifth set of educational technologies is more an aid to college and university instruction than a substitute for human teaching. Electronic mail, computer conferencing, computer search and information processing options all provide ways of making education more efficient. Electronic mail uses computers to send messages swiftly and cheaply over long distances; this could provide a low-cost mechanism for coordinating a statewide or regional educational network. Computer conferencing permits a group of people to interact across considerable distances and over a wide time frame (so that participants need not simultaneously be at the keyboard); again, this can save travel costs and makes possible joint endeavors by persons geographically distant. (The Institute for the Future has done a good assessment of existing teleconferencing projects in postsecondary institutions.)[6] Computer search provides a means for very quick data availability and retrieval, thus reducing both library and personnel costs for research. Information processing is a simple and rapid way of facilitating the editing

and production of documents.

Combined, all these technologies can ease the professional "busy work" functions faculty and administrators must perform, thereby increasing efficiency and effectiveness and reducing boredom. Some costs of adopting such approaches are that new skills for using machines must be developed and that increasing amounts of professional time will be spent without direct personal contact with other human beings.

Implications for Higher Education

These five developing technologies illustrate what could be done to change the existing instructional model in higher education. All the necessary hardware currently exists; the software does not. What would be the overall costs and benefits of deliberately moving higher education in this direction?

First, even with the large initial outlays of capital involved, college and university instruction would become less expensive. The first few years of such an effort might be very difficult, for money must be spent to implement these technologies before savings can be realized. Innovative funding strategies (such as long-term, low-interest loans from some of the Texas information technology industries) might be required. However, given the difficult economic times ahead (see discussion in next section), investing in such a change strategy could be very cost effective.

Second, massive faculty development efforts would be needed to prepare faculty to use these technologies for instruction and evaluation. Initial resistance to technological innovation is likely to be quite high; however, as faculty and administrators realize that new and larger markets for higher education are being created, this opposition will diminish. Certainly, if colleges and universities do not adopt these approaches, a competitive nonformal system of instructional delivery to home and workplace settings is likely to appear.

Third, governance of the Texas college and university systems would become more complex. Curriculum development and financing of higher education would shift toward centralization, but the learning environment would be decentralized to family and industry settings. New types of statewide telecommunications regulations would be needed. Inequalities in educational opportunity would be reduced, as instruction became more standardized and probably of uniformly higher quality (this opens up possibilities of special federal funding). However, local campus control over educational content would be somewhat diminished, and the need for quality control in curriculum development would be very high.

Summary

As the implications above illustrate, the use of instructional technology in Texas higher education would be a mixed blessing. On balance, however, the monetary savings and increased market share such innovations would create make them attractive avenues for exploration. A first step might be to initiate some pilot projects designed to research:

1. the degree to which these technologies can each be used in training-oriented courses,

2. the optimal mix of these different types of educational devices,

3. the "side effects" such technologies have on the sociology of the classroom environment, and

4. the best organizational structure for coordinating multi-campus technological networks.

Education has traditionally been one of the sectors of society most resistant to technological change. Now that information management technologies are becoming cost effective, Texas higher education should take the lead in exploring their possibilities, expecially given the concentration of information technology industries in the state and the economic challenges coming in the 1980s.

Economic Impacts on Higher Education

The financing of Texas higher education and demand for its services are intricately interconnected to the health of the national economy. A detailed forecast of economic trends in the 1980s is beyond the scope of this paper; certainly, developments in this sector are less predictable than demographic or technological change. However, some macro-level statements can be made about "human capital" investments and the work force in the next decade. A sense of the likely range of economic futures for the United States can also be delineated to indicate the amount of flexibility needed in strategic planning for Texas educational finance.

Higher Education as an Investment

To some extent, the choice to attend a college or university is an economic calculation. The costs of higher education (both direct and in foregone earnings) are compared to likely benefits in occupational access and long-term enhancement of income. Historically, these benefits have been high:

EFFECT OF EDUCATION ON EARNINGS OF FULL-TIME, YEAR-ROUND CIVILIAN WORKERS, 25 YEARS AND OLDER[7]

Educational Attainment	Median Income Women	Men
8 Years Elementary	$ 5,606	$ 9,891
4 Years High School	7,150	12,642
4 or More Years College	10,357	17,188
All Educational Levels	7,370	12,786

A number of emerging trends, however, threaten to reduce these incentives for prospective students.

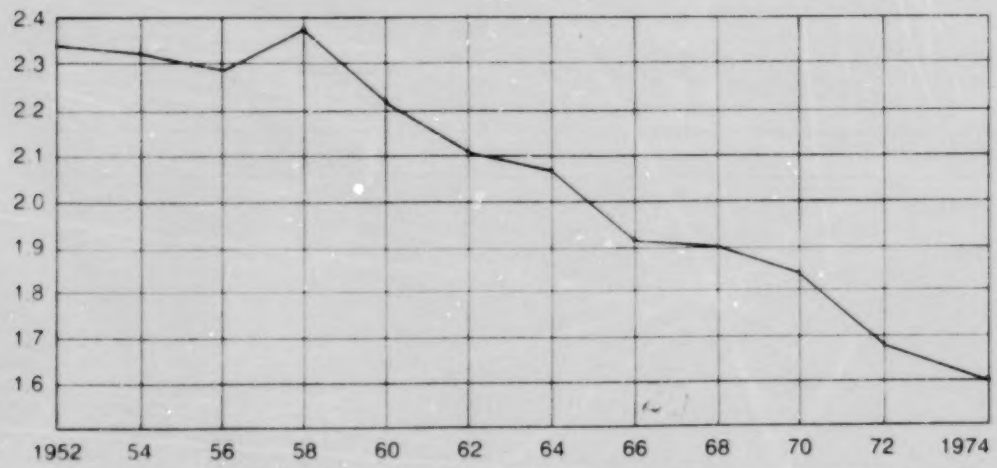
First, much of the recent growth in the size of the labor force has come from increased female participation, as illustrated on the facing page. Estimates are that 56 percent of U.S. women will be in the labor force by 1990, a participation rate for females in the prime working-age bracket (20-54) of 75 percent. The magnitude of the change this represents from historical patterns can clearly be seen in the graph which traces the participation of women in the labor force for selected cohorts.

At present, however, women as a group have much lower earnings than men (in 1974, the median wage for women working full time was only 57 percent of the male median). This situation is not improving: the increase in educational attainment among women has unfortunately not helped them to equalize their salaries relative to men. A college-educated woman earns approximately the same amount, on average, as a white male who has completed only elementary school.

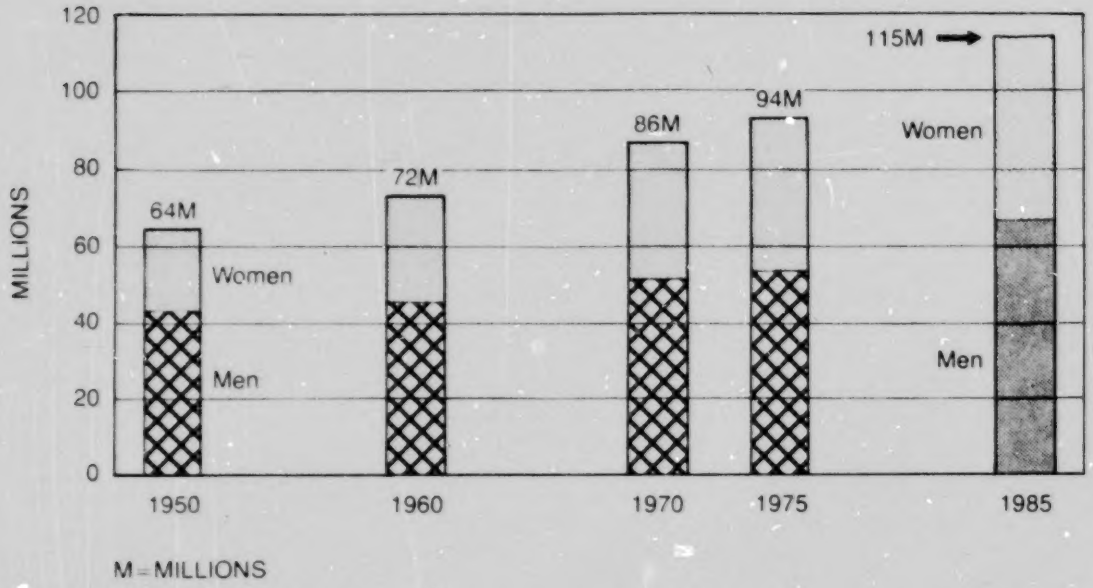
This disparity is partially due to discriminatory forces in high-status occupations. But it also reflects the fact that women workers tend to be clustered in a few occupations--primarily clerical, nursing and teaching jobs--which are not highly salaried. The "bottom line" is that, from an economic point of view, women have less to gain from increased higher education than men do; similar arguments can be made for minority groups. Yet, recruitment of women and minorities is very important if colleges and universities are to counter future problems of declining student population.

A second factor that will reduce the financial attractiveness of higher education is that underemployment is increasing as the number of educated persons grows more quickly than the number of jobs which require academic training. For example, by 1992 about 22 percent of the labor force will have four or more years of college, compared to 16 percent today and seven percent 25 years ago. As a result, a college education has rapidly become no guarantee to a high salary; in fact, between 1970 and 1975 the wages for high school graduates aged 25-34 increased 32 percent, while those of comparable college graduates rose only 19 percent. Over the last 15 years, the proportion of male college graduates who have had to settle for nonprofessional/nonmanagerial jobs has increased threefold; for women, fourfold.

RATIO OF PROFESSIONAL AND MANAGERIAL JOBS TO COLLEGE GRADUATES, 1952-1974[1]

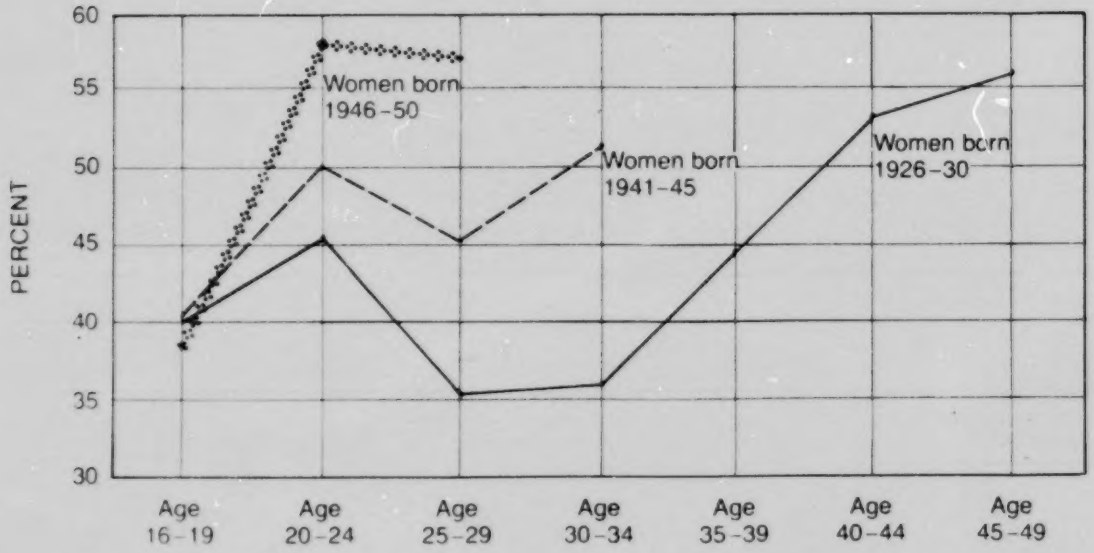


GROWTH OF THE U.S. LABOR FORCE, 1950–1985[1]



M = MILLIONS

WOMEN'S LABOR FORCE PARTICIPATION HISTORIES, SELECTED COHORTS[8]



Based on these trends, the U.S. Bureau of Labor Statistics projects a "surplus" of college graduates, reaching 140,000 annually by 1985. Students attending Texas colleges and universities in the 1980s will need to be given both realistic expectations of their employment possibilities and skills in life planning to help them cope with potential underemployment.

One factor which may help alleviate a drop in student enrollment caused by underemployment is that a "promotion squeeze" may develop by 1990. The concentration of workers in the 25-45 age bracket will be very high (52 percent of the labor force), and the ratio of younger workers to senior workers (who generally occupy the higher positions) will therefore increase sharply. In 1972, for example, there were only 98 workers 35-44 years old for every 100 workers aged 45-54; by 1985, there will be 142.[9] As career ladders become severely congested, many frustrated workers may use higher education as a route to midlife career change.

A third disincentive to college and university enrollment is that total discretionary income for U.S. households peaked in 1972 and in recent years has declined markedly under the impact of inflation. Drops in discretionary income have a significant effect on the public's ability to support higher education through tuition, taxes and contributions. Minority families are especially hard hit by this problem, as the income gap between white and black families historically has grown in times of economic difficulty. Thus, since inflation will continue at record rates (as later discussion will indicate), the ability of families to make a "human capital" investment in Texas higher education may decline.

The Occupational Mix in the Labor Force

There may be as many as 21 million more workers in the United States by 1990. What sorts of jobs will be available to this expanding labor force, and what types of educational training will be needed? An estimate based on historical trends would conclude that service sector jobs (particularly in medical, health and business areas) will increase in the next decade, while manufacturing jobs will decrease.

DISTRIBUTION OF U.S. LABOR FORCE BY INDUSTRIAL SECTORS[1]
(Percent Distribution)

Industrial Sector	1930	1950	1970	1975
Manufacturing	32.2	33.7	27.2	23.6
Wholesale and Retail Trade	20.8	20.8	21.2	21.9
Government	10.8	13.3	17.7	19.8
Services	10.6	11.9	16.4	18.1
Transportation, Public Utilities	12.6	8.9	6.4	5.9
Finance, Insurance, Real Estate	4.8	4.2	5.2	5.4
Contract Construction	4.7	5.2	5.0	4.4
Mining	3.4	2.0	.9	.9

Unlike the early 1970s, when 70 percent of the new college graduates were employed by the public sector, some 60 percent of these new jobs in the 1980s will be with private employers.

Of course, the actual mix of jobs will be determined by emerging national priorities, as well as past trends. The employment effects of alternative national goals have been explored by Roger Bezdek.[10] He used an input-output model to examine three alternative economic scenarios: a welfare economy, a military defense economy and a status quo projection. In all three scenarios, employment increases most substantially at higher skill levels and very little at the lowest skill level.

VARIATIONS IN EMPLOYMENT REQUIREMENTS IN SELECTED INDUSTRIES HIGHLY SENSITIVE TO ECONOMIC ORIENTATION (1980)[11]

(Variations are calculated using the status quo orientation as the baseline; that is, employment requirements under the defense and social welfare alternatives are shown as a percentage of employment requirements under status quo.)

	Status Quo	Defense-Oriented	Social Welfare-Oriented
Military Personnel	100	125	60
Iron and Ferroalloy Ores Mining	100	112	134
Lumber and Wood Products (except containers)	100	94	110
State and Local Government Administration	100	112	122
Federal Government Administration	100	104	95
Public Health	100	70	175
Public Education	100	75	160
New Construction	100	87	137
Radio, TV and Communications Equipment	100	109	93
Metalworking Machinery and Equipment	100	110	90

Further, in all three, the service sector experiences the greatest growth, while the farm sector and most middle-level management jobs decline. To the extent to which higher education is used for occupational access, these trends are likely to affect student demand for different types of courses.

Technological innovation will also alter the occupational mix and job

skills in the next decade. Many industries will move toward increased automation through microprocessors, as high inflation makes labor-intensive approaches extremely costly. Energy production and conservation, telecommunications and entertainment industries will be major growth fields.

The Range of Economic Futures for the United States

The 1980s are likely to be a time of major economic instability and uncertainty, as chaotic a period as has existed since the 1930s. On the domestic level, pressure will increase for protection of American jobs by limiting foreign imports, even at the cost of forcing consumers to buy higher-priced goods. On a long-term basis, this may strengthen the eroding American industrial base and provide needed capital for investment. On a short-term basis, protectionism will contribute to the inflationary spiral and may have serious international repercussions as other countries take similar steps in response.

Globally, economic interdependence has become so profound that small scale disruptions in a minor country may culminate in grave worldwide economic difficulties. Oil-supplying nations are one obvious example; less well known is the potential impact of defaults on indebtedness by countries such as Brazil, Ecuador or Turkey. (Brazil has accumulated such a large debt--primarily to U.S. banks--that two-thirds of its total export profits go to pay interest costs.) A national or even global economic depression could be triggered should any of these countries suddenly repudiate their obligations.

No obvious short-term solutions are available to control these (and other) potential sources of economic instability or to limit the negative consequences should a crisis develop. The spectrum of potential economic futures for the United States in the 1980s is thus relatively broad, ranging from a slow reemergence into the prosperity of the 1960s to a sudden collapse into economic catastrophe. Even with its prosperity based on the comparatively secure energy, health and information technology industries, Texas is vulnerable to economic disruption from these extra-state forces.

Perhaps the most "optimistic" probable future for the United States in the next decade is one in which technology and industrial productivity successfully meet the challenges that now confront the American economy. This scenario would have the following characteristics:

- The next five years are a period of national economic instability and uncertainty, with high rates of inflation eroding education's resource base and with intense competition among the human service sectors for limited amounts of funding.

- The five years following see the gradual reemergence of national economic prosperity, brought about by technological advances which relieve energy shortages and by large amounts of capital investment which increase American productivity.

- The political climate for augmenting educational funding becomes increasingly positive as massive job retraining and the emergence of an information-based economy make "human capital" an attractive investment.

The other extreme--and we will call it "pessimistic," although some would prefer it to the first--presents a very different picture:

- The initial five years of national economic instability and uncertainty described above culminate in an economic collapse as technology and technocracy prove impotent to solve resource and productivity problems. Inflation and unemployment both reach record levels; little money is available for education.

- Americans go through a period of intense reexamination of cultural values and priorities as traditional problem-solving strategies prove useless in alleviating this crisis. A "transformational" society begins to emerge, stressing cooperation, environmentalism, humanism and community at the expense of material affluence and high technology.

- The political climate for increased educational funding begins to improve, as Americans recognize the crucial need for education in attaining this new value system and in moving to a lower consumption lifestyle.

Neither of these extreme scenarios is likely to occur, but they do illustrate the end points on a continuum of probable futures for the United States in the next decade. One striking conclusion which can be drawn is that the range of possible futures which educational policy-makers must be prepared to anticipate is relatively large, and the level of uncertainty, particularly about secure funding for education, is unusually high. Hence, state plans for higher education will need a high degree of flexibility and a large number of contingency strategies to be effective.

Inflationary Pressures on Higher Education

How may such a variable and hazardous economic outlook affect the human service areas? Education, health, government and the other labor-intensive service industries are likely to experience grave financial difficulties in the next decade. Certainly, a severe downturn in the national economy would adversely affect budgets in these areas; less obvious are the negative effects that a long period of high inflation would have. Considering the impact of inflation on colleges and universities in some detail can illustrate how a number of quantitative fiscal changes may interact to produce a profound qualitative shift.

Part of inflation's potential for grave damage occurs because citizens seem to be approaching the maximum percentage of their income that they are willing to spend for education (currently a little less than nine percent of the Gross National Product). Potential funding for higher education is being eroded by the aging of the population, the dwindling percentage of taxpayers with students in college and competition from the recreation, transportation, housing, food and health sectors for the consumer dollar. Developments such as serious consideration of Jarvis Proposition II in California (which would slash human service expenditures by one-third) indicate that the trend toward more funds for education may be starting to reverse, in part because of the erosion of consumer discretionary income discussed earlier.

Education's proportion of the tax dollar has continuously risen, because in periods of inflation capital-intensive industries outperform labor-intensive sectors. For example, from 1965-75, the Consumer Price Index rose 69 percent, but educational costs rose 155 percent. Much of this can be attributed to salaries rising faster than capital costs. The continuous improvement of machines in efficiency stands in sharp contrast to recent low rates of increase in human productivity and is a key factor in this disparity.

For any sector of the economy, even small yearly reductions in budget cumulate to a major drain on fiscal resources fairly quickly. At present, inflationary losses for many educational agents are running at least 14 percent per year (even with severe cost-cutting), but revenues are growing at only about seven percent per year: about a seven percent net debit. In 10 years, an average seven percent loss per year will leave colleges and universities with one-half the revenues (in real terms) they now have.

Further, given the general economic woes society will experience from high inflation, higher education will not have a strong claim on social priorities in terms of extra funding. Creating a favorable business climate, reducing stress on the poor, minimizing government spending and coping with international tensions will take priority. Thus, even a high employment economic climate may well pose major problems for colleges and universities if inflation stays high; recession or depression would create even more severe difficulties.

Summary

Clearly, detailed regional economic studies would be useful in assessing Texas' likely economic status in the next decade. Such research might include:

- statewide projections of the size, composition and occupational mix of the labor force.
- forecasts of underemployment in Texas and the vulnerability of the state economy to national unemployment and inflation.
- assessments of the relative effectiveness of various strategies in reducing the cost of higher education (including both capital-intensive and labor-intensive modifications).

The data from these studies would aid in the preparation of contingency plans for the market orientation and financing of Texas higher education.

Conceivably, the economic problems discussed above will be smoothly resolved, and Texas, insulated by its prosperous industries, will have ample funds for higher education. However, the threat of high inflation coupled with problems of unemployment, resource depletion and political instability could create a very difficult economic future. Beset by adverse changes in both demographics and finance, Texas colleges and universities might then seriously have to consider shifting to the more capital-intensive, educational technology-based model of instruction outlined earlier.

Changes in Education's Political Climate

Forecasting shifts in the cultural and political context of higher education is very difficult. The attitudes of citizens are likely to be quite volatile in the next few years as economic turbulence and technological advance create rapid social change. However, a few general statements can be made about probable changes in cultural beliefs and values, the political mood which these changes will engender and the implications for Texas colleges and universities.

The Cultural Context of the 1980s

Social instability and change and a growing sense of lack of control will create difficulties in coping for many people, as the technological and bureaucratic complexity of society increases and the economic situation worsens. Reliance on the advice of "experts" for most decisions will become increasingly necessary, yet citizens will resent making choices on the basis of blind trust. Universal socialization of the population to the multiple, higher-order cognitive and affective skills required for participation in society would help alleviate this erosion of democracy by technocracy (and may be essential to the proper functioning of a high-technology society). However, many will be unwilling to allocate to higher education the major resources needed for this socialization.

Heightened value conflicts will occur as multiple special interest groups battle over individual ethical issues such as abortion, individual rights and responsibilities and biomedical manipulation. Perceived incapacities of technology and technocracy to deal with current crises will cause a major struggle between those who continue to espouse a narrowly rational, high technology-based, materialistic "American Dream" and those who proselytize for a shift to a more adaptive, ecological, spiritual lifestyle. This conflict will reflect the uncertainty among Americans about whether the "optimistic" or the "pessimistic" economic scenario discussed earlier will prevail.

Planning, leadership and self-renewal will become increasingly problematic for institutions as responding to crises in the "here and now" consumes ever greater amounts of time and resources. One risk of this cultural anomie at a time of economic distress is the emergence of a charismatic dictator, who will use a "rally-around America" ideology as a basis for limiting diversity and pluralism.

Leadership will become very difficult in higher education as multiple, continual problems drain resources. The strains which students experience in their lives will make maintenance of traditional academic standards almost impossible. A pervasive sense of lack of control will cause disillusionment, apathy and cynicism about the possibilities of preserving the current college and university system.

Shifts in Politics and Governance

Financial pressure on citizens will intensify the existing "anti-taxes" movement, and business groups will attempt to link anti-regulatory arguments

to this cause. The result will be a pervasive "reduce governance" stance. Conflicting pressures will come from those who push for "strong leadership" to ride roughshod over inconvenient regulations and safeguards. Representative democracy will thus be eroded by pressures both for localism and for unitary authority.

Public response to emerging resource crises (e.g., water) will continue to be directed toward programs for crash priority replenishment. These will tend to be oriented toward high technological sophistication rather than conservation measures involving lifestyle changes. Competition among federal (and state) priorities will become extremely intense, to the relative detriment of long-range needs and issues.

Demands for accountability and evidence of competence will force conservative decision-making and the proliferation of paperwork to document performance. These tendencies will create further problems in institutional ability to respond to change. Gains toward increased citizen participation in decision-making may be reversed as efficiency and effectiveness decline and public antipathy to red tape and bureaucratic procedures grows. Academic freedom and tenure will be seen as luxuries by increasing numbers of taxpayers.

Concern will increase over the relative economic and military status of the United States in the world. National defense will reemerge as a top priority area, and the performance of colleges and universities will be adversely compared to that of their counterparts in other countries. A tendency toward forceful action to ensure availability of key resources will be coupled with a belief that U.S. affluence is more important than global egalitarianism. Some conventional "police actions" may occur as a new, multiple-country Cold War evolves. Should this take place, potential college and university students may be conscripted into military service, and an emphasis on high quality schooling for the intellectual elite is likely to reemerge.

In Texas, the dwindling of state and university oil reserves will cause mounting concern as the search intensifies for a politically acceptable alternative source of revenue. Any attempt to raise taxes (on sales, property or income) will be unpopular, and corporate taxation will be resisted by the legislature as creating a bad climate for business. Necessary increases in formula funding may be very difficult for colleges and universities to obtain.

Changes in Federal Policies for Higher Education

In the coming decade, the state of Texas is unlikely to increase the priority it has historically placed on higher education. Since existing state formulas generate relatively little discretionary funding, federal initiatives will probably remain the major public source of money for new directions. What are federal education priorities likely to be in the 1980s?

At present, the generally accepted definition of the federal educational role is:

MAJOR GOALS

1. promotion of equal access
2. enhancement of equal achievement

MINOR GOALS
1. research toward new directions
2. assessment
3. dissemination

In higher education, much of this federal funding has come in the form of student aid to increase equity of access; money for research and improvement has been limited and is unlikely to be a high priority in future congressional sessions. In general, federal funding for education can be expected to erode throughout the first part of the decade because of pressures to hold down spending and due to intense competition among the human service sectors.

Alternative student financing systems may well be considered as federal funds become more constrained. Joseph Froomkin discusses three possible approaches in his book on federal policy in higher education;[12] the laissez faire strategy, the Swedish model and the eclectic system.

- The laissez faire strategy would burden each student with the full cost of his higher education, using a system of public loans (conventional or income-contingent) and eliminating college and university subsidies from public expenditures.

- In contrast, the Swedish model assumes that all costs of postsecondary education are shouldered by the state, regardless of the family income of the student. In this situation, grants and very long-term, low-interest loans would supplement current public subsidies from taxes.

- The eclectic model combines features of each by using government subsidies to encourage college and university students to study and work concurrently. The bachelor's degree would become a six-year program for many students, who would spend 25 to 30 hours per week in the workplace.

Whether any of these models are actually adopted, contingency planning should be undertaken to evaluate their relative strengths and weaknesses, and the federal and state governments both are likely to begin examining current financing systems carefully.

In general, a temptation for federal policy-makers will be to fund only immediate-impact, targeted programs as a method of building constituent support for educational funding by Congress. Such a strategy can only backfire eventually, as problems of colleges and universities worsen for lack of attention to their root causes.

Summary

Heightened tension, struggles among special interest groups and a general vacuum of common purpose in the society will make the 1980s a very difficult time politically. Funding from traditional sources will become increasingly hard to obtain as the historical role of higher education is seen as somewhat peripheral to current societal concerns. The autonomy of college and university governance could be threatened as citizens demand efficiency in achieving relatively limited goals. To surmount these challenges, higher education

will need to forge a new role in the 1980s, an overarching purpose which again makes it central to America's strength and prosperity.

New Directions for Higher Education

The next decade does not appear to be a period in which colleges and universities can afford to cling to present approaches, hoping for American society to return to the educational attitudes and funding characteristic of the 1960s. Earlier in this paper, a shift in the current model of higher education toward capital-intensive, technological strategies was suggested as a potential new direction. Given conservative attitudes in Texas on what colleges and universities should be, how might such a change be justified?

One approach might be to define a new function for Texas higher education. Colleges and universities, as a collective whole, would become responsible for coordinating knowledge production and distribution systems in the state. That is, higher education, as the sector best equipped to accomplish these vital purposes, would:

- coordinate the process of anticipating societal needs for knowledge.
- develop in educational institutions the capacity for training appropriate levels of human resources.
- assess the ability of current institutional research mechanisms for generating needed knowledge and augment this capability where necessary.
- organize the dissemination to citizens of vital knowledge so that it is fully utilized.

Such a mandate would include expanding educational services to all adults, using campuses, families, communities, the workplace and the media. Intrinsic in this effort would be activities as diverse as helping to develop television programming to respond to a gasoline crisis, initiating long-range studies of "the basics" needed by citizens in the next 10 years and participating in "partnerships for productivity" with industry.

Some of these activities now take place at varying levels of quality within colleges and universities. Others have been left to the "invisible hand" of economic self-interest. A lack of overall coordination and integration, however, has resulted in many of the emergent problems of the 1980s. For higher education to assume these central coordination responsibilities seems the best solution because the production of knowledge and human resources is its primary function, and this new role is entwined with its current goals and responsibilities.

Such a new goal transcends "fine tuning" of the existing system to give a simultaneous mandate for expanded services and a carefully limited set of objectively measurable priorities which colleges and universities are best equipped to execute. The costs of implementing these additional responsibilities may well be more than defrayed by the increased efficiency of integrated efforts and by the benefits in societal productivity that ensue. In fact, when compared to the results of a laissez faire approach

for the past decade, this strategy provides such a potential strengthening of economic productivity as to be justified on that basis alone. Thus, this proposed change represents a discriminate augmentation of higher education's mandate based on cost/benefit considerations and arguments for efficiency and effectiveness.

What would need to be done to explore this potential new direction? First, a series of studies needs to be undertaken to determine and document the cost to society of not now coordinating:

1. the anticipation of societal needs for knowledge,
2. the development of human resources,
3. the generation of needed knowledge, and
4. the dissemination of knowledge to citizens.

Such studies could serve as the basis of a rationale for organizing the activities now taking place in these individual areas.

Second, delineation is needed of the relative roles of individuals; corporations; educational institutions; local, state and federal governments; and other social agents in knowledge production and distribution. In particular, the essentiality of a central coordinating role must be evident if public and private support is to be obtained.

Third, current college and university efforts to improve portions of the knowledge production and distribution process need to be assessed. The competence of existing programs in this area must be documented and their cost effectiveness shown.

If such a rationale is carefully built and documented, the very trends that threaten the well-being of colleges and universities will become arguments for the priority of maintaining high-quality education.

Perhaps some other new direction would be more appropriate. The key point is the necessity of determining how colleges and universities can be perceived as centrally important to the prosperity of Texas and the nation. Otherwise, even the best planning efforts will be met by indifference on the part of decision-makers outside of education.

Conclusion

All of education is predicated on images of the future. Educational research is tailored to the future contexts in which it is to be used, instruction is based on a vision of the world in which today's students will be decision-makers, and college and university budgets assume that economic and demographic projections will be accurate. What does it mean for our daily work if the future seems ever more indeterminate and negative developments increasingly likely?

When people aren't certain about what's going to happen, or the future seems threatening to them, the natural response is to retreat into a psychological framework in which we say, "I don't know what's really going to happen,

but the safest thing is to assume that at least some things will stay the same. These perennial issues are the areas in which I'm going to work; it's too risky to respond to a mere probability." So, almost all our current efforts are spent wrestling with "eternal" educational issues and problems. Perennial concerns are crucial and should absorb perhaps 70 percent of our resources, but the other 30 percent needs to be oriented toward resolving the uncertain future issues outlined above. The least speculative stance to adopt is to acknowledge and prepare for legitimate indeterminacy.

This paper has argued that major demographic, economic and political disruptions are likely in the 1980s. The various research studies suggested in each section will be useful in anticipating these oncoming problems, particularly if these projects are integrated into an overall planning and monitoring system for Texas higher education. A model for strategic planning in higher education that has been widely utilized and highly praised is the futures-creating paradigm of the Resource Center for Planned Change at the American Association of Colleges and Universities.[13] Use of some such approach would be helpful in evolving a statewide master plan which can move from reacting to projected developments into shaping a new vision of what higher education can become.

The 1980s will be a grim period, in part because America believed that a pre-college education was sufficient for most citizens, that a high-technology society could be run by a small group of experts and staffed by a large group of people with rudimentary knowledge in "the basics." This assumption is obviously wrong; a complex society requires that each citizen be as knowledgeable and creative as possible. The costs to our society of not educating one person--in terms of crime, welfare expenditures and foregone productivity--are far higher than the expenses of a good education from birth throughout life. For this reason, it is vital that Texas higher education assume a more central role in the lives of citizens, thus laying the foundation for a bright future.

NOTES

[1]These projections assume that future birthrates hover around the replacement level (i.e., 2.1 children per woman) and that women will have children in their early to mid-20s (projection represented by broken line). The dotted line assumes that females who are products of the "baby boom" will have fewer children later in their lives and that many will choose not to bear children. From Alternative Futures and Post-Secondary Education in Pennsylvania (Report R-39). Robert Johansen and Maureen McNulty. Institute for the Future. Menlo Park, CA, 1977.

[2]From Demographic Trends Influencing the Elementary and Secondary School System. Office of Technology Assessment, U.S. Congress. Washington, D.C., 1977.

[3]For a more extended discussion, see "Educational Challenges of the 1980s" by Robert G. Wegmann in Needs of Elementary and Secondary Education in the 1980s. Subcommittee on Elementary, Secondary, and Vocational Education, Committee on Education and Labor. Washington, D.C., 1980.

[4]College Enrollment: Testing the Conventional Wisdom Against the Facts. American Council on Education. Washington, D.C., 1980. Also see Three Thousand Futures for Higher Education, the last Carnegie Commission report.

[5]Derived from The Urban Predicament. William Gorham and Nathan Glazer, eds. The Urban Institute. Washington, D.C., 1976. "Texas Teacher Supply: A Crisis Ahead" by Clifton S. Harris at The University of Texas-Dallas cites three projections of Texas demographics which may provide useful information for student population forecasts.

[6]Electronic Education: Using Teleconferencing in Post-Secondary Institutions (Report R-42). Robert Johansen, Maureen McNulty, and Barbara McNeal. Institute for the Future. Menlo Park, CA, 1978.

[7]From "A Statistical Portrait of Women in the U.S." in Current Population Reports. U.S. Bureau of the Census, Series P-23, No. 58. Washington, D.C., 1976.

[8]Handbook of Labor Statistics, 1975. U.S. Department of Labor, Bureau of Labor Statistics. Washington, D.C., 1975.

[9]The Demographic Context of Educational Policy Planning. Peter S. Morrison. RAND Corporation. Santa Monica, CA, 1976.

[10]Long-Range Forecasting of Manpower Requirements--Theory and Applications. Roger Bezdek. New York Institute of Electrical and Electronics Engineers. 1974.

[11]Although the total wealth (or GNP) produced by all three scenarios is the same, the level of employment varies by seven million ("social welfare" employs 101 million compared to 94 million under "defense" and 96 million under "status quo").

[12]Needed: A New Federal Policy for Higher Education. Joseph Froomkin. Institute for Educational Leadership Policy Paper Six. Washington, D.C., 1978.

[13]A Futures Creating Paradigm. Resource Center for Planned Change, AASCU. Washington, D.C., 1978.

LEADERSHIP IN HIGHER EDUCATION

by Joseph F. Kauffman

Although some institutions will face great difficulties in the decade ahead, I do not believe that it is accurate to predict "decline" for higher education. A more accurate term would be turbulent and rapid changes. The quality of our educational leadership in the 1980s will, in large measure, determine the usefulness of our public colleges and universities to humankind in the 21st century. This issue, therefore, is far more important than the self-interest of faculties, administrators and governing boards. It is an issue of fundamental relevance to the public interest.

In this brief report I shall describe some assumptions about the external environment in which public postsecondary education exists in this decade and, concomitantly, my assumptions about the internal environment impacting on our thoughts and actions inside our institutions. The resultant need for greater leadership and increasing the legitimacy of the presidency are described, followed by a sketch of the specific kinds of leadership needs I believe necessary. Finally, suggestions on recruiting and selecting college and university presidents, and supporting them, are detailed. Although one must write in general terms about these matters, I have attempted to use a functional approach and suggest primarily those proposals which can be implemented.

The External Environment in the 1980s

Although uncertainty always exists and natural disasters or world events may surprise us, there are some assumptions that can be made about the social context in which our public colleges and universities will exist throughout this decade. Those assumptions must include the changing demography in our nation; the state of our economy, due in part to inflation, energy costs and lack of growth; and the lowered sense of the value, or priority of public financial support, for non-vocational postsecondary education.

The demographic facts are clear and only need interpretation in institution-specific or region-specific terms. The number of high school graduates will be fewer in the years ahead. The population profile will be changing. There will be more older people. Some ethnic groups will be growing faster than the general population. (This seems to be clearly the case with the hispanic population in the United States.) Anyone engaged in higher education must link with this new reality in order to plan intelligently--whether that planning be for retrenchment or new programs and services for new or changing populations.

The instability of our economy appears to be a natural part of the environment as well. It would be prudent to assume inflationary cost, beyond productivity gains, and uncertain energy cost, which can only rise in a seemingly episodic manner. Even if growth is restored to our national economy and unemployment diminishes, it seems clear that there will be a greater struggle to obtain stable, adequate, financial support for public higher education in the 1980s.

One more ingredient needs to be identified as a part of the external environment in which we function and that is the loss of the automatic credibility that marked our enterprise in the 1950s and 1960s. In the struggle for scarce public revenues, non-vocational higher education can no longer assume that its worth is well understood or appreciated. It can no longer assert its value to the public interest. It must find ways to restore its credibility and priority. The reasons for this are too complex to analyze in this report. Yet the need to recognize this fact seems urgent to me. This need cannot be left to others.

All of the above affects the political climate in which public higher education exists. Harried public officials are subject to the pressures which flow from these factors I have sketched above. They cannot be expected to do the "right" things always, and those responsible for public higher education must be assertive if the "right" things are to be supported very frequently.

The Internal Environment in the 1980s

Obviously, the concepts of internal and external environments are not mutually exclusive. We have interacting environments, each affecting the other. Yet it is useful, for descriptive purposes, to identify those aspects of a campus or institutional environment which are crucial to understanding the leadership problems we must face in this decade. Presidents, and those who select presidents, must be mindful of these factors as they seek to cope with a turbulent environment and to strengthen the ability of our institutions to serve well the long-range public interest. I wish to identify four factors in the internal environment which seem to me to complicate greatly the leadership role of the college and university presidency in this decade. These factors are the increasingly complex and diffuse governance arrangements which confuse accountability; the growing constraints on our administrative leaders; the era of no-growth or cutbacks which confounds our assumptions about collegiality and democratic decision-making; and the critical problem of faculty morale, that must be improved if we are to renew our institutions and survive the decade spiritually.

Peter F. Drucker[1] has used the term "double-headed monster" to describe the enterprises which depend for their performance on professionals who are dedicated to their discipline rather than to the institution, who are the more productive the more dedicated they are, and who, at the same time, have to work toward the accomplishment of the goals of the whole. This leads to a double-headed organization with its business management side and its professional side. Administrators have as their major task the enabling of professionals to do their work. Yet in times of budget retrenchment organized dualities are places of great conflict. Decisions about budget are decisions about professional programs or activities. Administrative decisions and academic decisions are intertwined as never before. Yet who is to be held accountable?

Further, the state and federal government have moved into institutional governance to a degree that seemed unthinkable 20 years ago. Through statutes, regulations and executive orders, government now places an often heavy hand on all priority-setting and decision-making activity. Accountability is fragmented and confused. A morass of intrusions and requirements lead to a

multiplicity of "bottom lines." Meeting all of the governmental requirements may seem like successful performance for an administrator, but it may not mean helping the institution serve its publics any better. What it most certainly means is that college and university administrators must function under the weight of constraints that are often burdensome in the extreme. As we inhibit the exercise of discretion and good judgment, we inhibit and discourage leadership. As Commissioner Ashworth[2] has observed, "Like Pavlov's dogs, administrators bit by bit are being conditioned to stay within very limited and well-trodden paths by shocks, commands, intimidations and orders."

In addition to being turbulent, the decade ahead may well be one of very slow or no growth in fiscal resources for education. This has profound implications for the style of governance in higher education and for the role of management as a result. In a "zero-sum' fiscal environment, change and decision-making are accompanied by sharp conflict. Gains for one department seem to be, and often are, at the expense of another department. Academic innovation often occurs because there is consensus and general approbation for new ideas and programs. When we are in a "zero-sum" mentality, consensus is often replaced with conflict, and democratic processes of decision-making are exceedingly difficult to maintain. The legitimacy of the leader is challenged when resource reallocation is the dominant mode for coping with scarce resources. There are few rewards that can be given, no matter how greatly deserved. If across-the-board cuts are made in appropriations or allocations, the most efficient and able administrators may be hurt the most, for they have already eliminated waste. Thus, the morale of administrators is a serious problem for governing boards to consider in the time ahead.

The faculty is the core of the academic enterprise and governing boards and administrators must be concerned with faculty morale, creativity and renewal. The constraints we place on administrators today impact on our faculties as well. The professoriate has experienced many shocks in the past decade, and the years ahead may add to a sense of foreboding.

We have gone through a period of attacks on the liberal arts as effete or irrelevant. We have seen the PhD degree go from symbol of rare attainment to a "glut" on the academic market. With reduced faculty mobility and attacks on the tenure system, we are in danger of creating an internal environment in which civility is difficult to achieve and institutional development and renewal become impossible. The administrative leadership we recruit, appoint and reward in the next decade must intervene in this self-destructive trend or the very motivating spirit of our educational institutions will have shriveled.

Administration in the 1980s

If my assumptions about the external and internal environments of higher education are even partially correct, we shall require superb leadership for our institutions in the years ahead. That means that governing boards must demonstrate their sense of responsibility for their institutions, select strong administrative leadership, do all they can to increase the legitimacy of that institutional leadership and clarify the governance and accountability lines of all constituencies in the institution.

There is not much joy in being a college president today. The reasons for this should be clear from an understanding of the environment described above. Yet it has never been more important for us to have sound and enlightened administrative leadership for our colleges and universities. In a contracting organization we cannot make many mistakes without serious consequences. Yet we seem unable or unwilling to find ways of dignifying and legitimating the important role of administrator.

The traditions of a "community of scholars" have made for a tradition of amateurism in university administration. One "takes one's turn" in accepting the onerous duties of academic administrator. Barry Munitz[3] has observed that, "as long as our strongest academic administrators insist they cannot wait to get back to full-time faculty status, instead of emphasizing the valuable nature of their current multilayered commitments, then the administrative enterprise will be threatened, if not demeaned."

It is my own strong view that it makes a great deal of difference who is president or chancellor of a college or university. Therefore, we must examine the incentives and disincentives for assuming such a position. It is also my view that because such service is often temporary, rather than permanent, we have even a greater need for purposefully supporting and honoring such service. Governing boards must accept the responsibility for this, for the chief executive officer is their agent in carrying out their public trust.

Leadership Needs

If my assumptions are correct about a turbulent state ahead of us, how do we develop leadership for the future and what kind of leadership is required?

We have no formal system for training leaders in higher education. In the public elementary and secondary schools there is a system of licensing or certification that one is qualified to be a school or district administrator. It is a controversial system, at best, and not one to be emulated for our diverse postsecondary enterprise. Nevertheless, this continues to be a problem. In colleges and universities, leaders tend to be identified by their peers. The dominant coalition on a particular campus will identify one of their number who not only shares their values but articulates and defends such values effectively. Such persons may be adopted by mentors. Eventually, such persons become sponsored by the leadership of their institutions--nominated for leadership training experiences under the aegis of national organizations such as the American Council on Education, or nominated for positions at other institutions seeking deans, vice presidents and presidents. It is rare for persons to be purposefully groomed for the top leadership in their own institution simply because leadership succession is such a quixotic matter in our institutions of higher learning.

The problem with all of this is similar to that encountered in the search and screen process of presidential selection. Do any mavericks get through the screen, or are they only the conciliators whose definition of success may be sheer survival? (I will address this in the latter half of this report.)

I turn then to my views of the kinds of leadership that we require in our colleges and universities. I think we need politically effective leadership, visible leadership and leadership that cherishes the essential value of our educational institutions and their potential for dignifying humankind and shaping its destiny. Only with such leadership can we release the creative energies within our institutions that are the solution to our problems.

We often use the word "political" to mean something pejorative. That is too bad, because politically effective leadership is necessary, particularly in our vast public sector of higher education. I once heard someone describe two different approaches to public relations: that which seeks to find out what people want and caters to that; and that which knows what it needs to do and convinces people to accept that. Similarly with the concept of politically effective leadership, there are those presidents who are perceptive and tune-in to the prejudices of the public and their elected representatives, pandering to their transitory whims. They may be popular, but I do not consider that political effectiveness. In my terms, a president should know what is needed in the way of public support and be effective in terms of the extent to which he or she can build support for those needs.

The low-profile president may have been of value during the past decade. I believe we need visible leadership now--leaders who will teach the public. I speak of what James MacGregor Burns calls "transforming" leadership. Although he is speaking of political rather than educational leaders, his view is even more germane to the opinion I want to communicate. Burns[4] states:

> Leaders can also shape and alter and elevate the motives and values and goals of followers through the vital teaching role of leadership. This is transforming leadership. The premise of this leadership is that, whatever the separate interests persons might hold, they are presently or potentially united in the pursuit of "higher" goals, the realization of which is tested by the achievement of significant change that represents the collective or pooled interests of leaders and followers.

There is, of course, a risk in being a visible leader and attempting to be a transforming leader. But in the years ahead we will be sorely tested. If we believe that our institutions have value, we must articulate that value and achieve adequate understanding and support. We must find leaders who are dedicated enough to the purpose of higher education that they will expend themselves, if necessary, for that purpose.

Selecting College and University Presidents

In this report there is no attempt to set forth a step-by-step treatment of the search and selection process for college and university presidents. There are two contemporary books on presidential selection: (1) my own guidebook, The Selection of College and University Presidents, published by the Association of American Colleges in 1974; and (2) Presidential Search, written by John W. Nason and published by the Association of Governing Boards in 1979. It is my intent here to identify those vital aspects of presidential selection which are primarily in the hands of governing boards.

The Board's Responsibility. It is the governing board that appoints the

president and, typically, the president serves "at the pleasure" of the institutional governing board. To find, appoint and retain a president with the qualities necessary to lead their institution is one of the most important responsibilities of trusteeship.

The governing board must determine, and be satisfied with, the search and screen process that is established; the criteria and qualifications utilized in the search; and the arrangements for constituent participation or consultation.

When a presidential vacancy occurs, one of the first duties of a governing board will be to develop--preferably in consultation with representatives of constituent groups--a description of the institution's situation, and its current and near future needs. Borrowing from other institutions the general or idealistic "philosopher king" formulations serves no functional purpose. Obviously, any president should be a person of virtue and physical stamina. But a presidential vacancy is not only a time of trauma but a time of opportunity to reappraise an institution's condition, its direction and leadership needs.

I believe that the qualifications and criteria for the selection of a new president should be related to the specific needs of an individual institution or system at a particular point in time. This specificity means that we need to identify situational rather than personal matters. From an assessment of its goals, its situation and its needs, the qualifications of an institution's next president will be formulated. Thus, the governing board must assume the responsibility for seeing to it that such an institutional assessment is conducted. If there is considerable conflict within the institution, the board may require external assistance in making such an assessment.

An institutional assessment implies a reappraisal of the institutional mission and the performance of the institution in light of that mission. Governing boards may wish to alter institutional priorities as a result of such an assessment. At the least they will want to reaffirm the institutional mission, establish priorities of effort and attainment for the current period and seek a president who will make a commitment to implementing their decisions.

In any state, there are differentiated missions and functions assigned to individual public colleges and universities. Large, complex universities may also have a wide variety of functions and responsibilities assigned by the state. Whatever the role, scope or mission of an institution--once it is decided--the governing board should expect maximum effort to achieve quality of outcomes. We are often confused by the concept of "quality," relating to it only on a one-dimensional basis. In a public system of institutions there may be a wide variety of programs and missions, from open-admissions, community service institutions to the most advanced research-oriented graduate centers. Their purposes are differentiated to serve different, but equally valid, public needs. There can be an equal concern for high quality in all such endeavors. In selecting leadership for our institutions we must be sure that we do not appoint persons who denigrate the importance of achieving high quality within the definition of that institution's mission. Matching appropriate leadership qualities and commitments with specific institutional goals is crucial to success.

There is often considerable impatience with such talk of institutional goals and missions, and I do not minimize the mischief that can be made with such concepts. Yet it should be remembered, especially by governing boards, that mere institutional survival or presidential survival are inappropriate values around which to rally public support.

From the emphasis above on assessing and reassessing institutional leadership needs, it may appear that the presidency is a vulnerable position. In my own view it certainly is, and I believe that it may be in the public interest for us to see the presidency as a temporary role. That does not mean that the president is unimportant. On the contrary, it means that we must insist that our institutions are of such potential value to our society that they must constantly reexamine and renew that value, even at the expense of those who lead them. Such temporary presidential service then becomes worthy of considerable support, dignity and honor. Otherwise, we shall not be able to attract those who have the qualities to serve in such a vital capacity. If a governing board agrees with this concept of the presidency, it will arrange not only for periodic assessment of the presidential performance, but also for presidential renewal leaves, tenured faculty positions for presidents who wish to be relieved of presidential duties or terminal salary arrangements that facilitate dignified exits when they become necessary for the good of all. Ignoring such matters, yet insisting on the expendability of presidents, is inexcusable personnel policy.

Participation. The first issue a governing board will have to decide when establishing a search and selection procedure to fill a presidential vacancy is that of consultation or participation by faculty and others inside and outside the institution. While governing boards may, at first, resent the expectations or demands for participation or consultation, there is an important principle to be weighed here: that of the legitimacy or authority of power in a human organization. How does one's authority obtain legitimation without appearing to be imperious or arbitrary? How does a governing board assure its appointee that the various constituent groups will accept his or her authority and be cooperative--at least at the outset of a term of office? In my view, the best way is to gain the support of the various constituent groups through their representation, participation or consultation in the search process.

Just as it would be unwise to conduct a reappraisal of an institution's situation and leadership needs without faculty and staff consultation or participation, it would not be sensible to choose a president unacceptable to those constituencies. The president is usually seen as the link between all the constituencies of a college or university. Failure to provide for constituent consultation or participation in presidential selection usually results in resentment and in a lack of cooperation or commitment to the success of the chosen leader. Nevertheless, I am not unmindful of the difficulties, politics and conflict that can result from such constituent participation. The governing board must always determine the process by which such participation occurs and retain to itself the authority and responsibility for the actual appointment of a new president.

Recruiting Candidates. Unless some unique circumstances provide a defensible rationale for an inside appointment without a search, I strongly recommend an open national search for presidential vacancies. Legitimation

of the authority of a newly appointed president can be difficult if no real search is conducted. In addition, an appointment without a real search could go against constituent expectations that flow from equal opportunity legislation and affirmative action requirements.

Some people overestimate the restrictive nature of affirmative action and equal opportunity requirements. For example, a general announcement or advertisement for a presidential vacancy does not prevent the search committee from soliciting nominations and applications from a variety of other sources as well. As long as the same criteria and requirements are used to evaluate all candidates, it is perfectly appropriate and desirable to extend a search beyond those who apply.

I believe it is essential to recruit outstanding persons and to enable them to be considered by a search committee before having to declare themselves as applicants or candidates. The presidential tradition, going all the way back to the rector of the medieval university, requires that a person be called to the office rather than apply or campaign for it. The metaphor of "application" is difficult in such circumstances; and it implies a desire to leave a present position, which makes such persons unnecessarily vulnerable. The style, therefore, is to arrange to be nominated if you seek to be a candidate. If a search committee does an effective job of contacting knowledgeable people and enlisting their help, nominations and suggestions will be forthcoming for persons who did not initiate the effort and may even be unaware of it. Persons suggested in this manner may already be in presidencies and may be the most attractive prospects to the search committee. Every effort must be made to enable a search committee to consider, at least in a preliminary way, attractive prospects without scaring them off by demanding that they declare themselves "applicant." This applies to persons inside the institution or system, as well as to external prospects. Some university systems recruit administrative talent on a continuing basis, identifying and communicating with persons they deem impressive and promising. When vacancies do occur, such persons are then contacted, in addition to the other actions of the open search process described above.

Screening Candidates. When screening and assessing potential candidates for the presidency, it is useful to revisit the objective of the entire effort: to find the best qualified person to lead the institution or system, given its present situation and needs, in a process that ensures, as far as possible, respect for and cooperation with the new leader. Remember, too, that recruiting and keeping good candidates in the search requires an acknowledgement that the process is a two-way street. Potential candidates are looking over the institution and its representatives, as well as being looked over.

One problem is the assessment of prior administrative experience and success of candidates. We normally assume that holding a position for several years means success in that position, yet it is necessary to find a way to evaluate critically the accomplishments in that position. How does the person get along with others, inspire confidence, delegate responsibilities, manage and lead? What have been the strengths and limitations of the person in the present position, and how do those characteristics relate to the demands of the new position? Mistakes made should not eliminate anyone, nor should controversy. Rather, has the person been willing to act and has the person learned from mistakes? The complete absence of controversy could

mean an unwillingness to make difficult decisions or to act on important matters.

Usually, a selection committee is extrapolating from an assessment of performance on one job and projecting how that might relate to prediction of performance on the new job--the presidency in question. The person's proven strengths should be especially relevant and matched to the needs of the new position. These might be management skills, or human relations skills, or representational, fund-raising skills. Demonstrated commitments or achievements to the values and mission of the institution, to quality, to productivity, are other types of characteristics important in assessing candidates. We must be aware that we are constantly in danger of the "Peter principle." Needed is a way of finding out if we are taking someone out of a job he or she performed competently and placing him or her in a new position in which he or she will be incompetent. There are effective vice presidents who would not be effective presidents, and a successful president of one type of institution might not prove successful in a different type of institution.

Another problem of the assessment phase of a presidential search, often associated with maximum participation of constituent representatives, is that all but the timid will be screened out. Those candidates with survival skills, those with "nice" personalities, those who will appease rather than lead, may become the only finalists in the search. Search committee members and governing boards must be vigilant that getting "nice" people, free of any hint of controversy, does not become the principal dynamic in the screening and assessment process. That is why I always recommend that governing board members and constituent representatives participate <u>together</u> in interviews so that candidates cannot pander to one constituency at a time.

<u>Helping New Presidents</u>. The governing board's task is not complete merely by making the presidential appointment. In some ways, it is just beginning, for the governing board is key to presidential success. There needs to be a purposeful orientation to governing board expectations and to institutional processes and resources. Such orientations rarely occur. More typical, at the conclusion of a painstaking and time-consuming search process is the total abandonment of the new president to sink or swim in the new post. Conferring the authority of president on the board's choice, gathering the constituencies of the institution together for some kind of formal conferring of that authority and making clear that the president is functioning under governing board authority vested, by the board, in the president, is important in establishing the legitimacy of the office and persona of the president.

The nature of the continuing relationship between the president and the governing board is crucial to the success of the president. The maintenance of an effective working relationship between the board and president is the responsibility of both. A strong board ought to want a strong president. A strong president will not attempt to weaken a board's authority. The two go together, for the authority of the president is enhanced if the board insists on its right to review and its need to approve policy and fiscal matters. That means that a president's recommendation becomes crucial to a board's decision, and the president becomes the key to the decision-making process on major institutional matters. Of course, all of this

hinges on the president's ability to get the board to act in a rational, predictable manner. It also means that when the board loses confidence in the president's judgments and recommendations, the process requires that the president be replaced.

Improving the relationship between the president and governing board thus becomes vitally important for the well-being of the institution. Suggestions for improving this relationship would include the following:

1. There should be regular efforts made to clarify the mutual expectations of both boards and presidents. At the very least, there should be the opportunity to revisit priorities of effort and policy planning annually. Such an opportunity should enable the president to express concerns about board behavior as well as the board expressing its expectations of the president. The board's failure to clarify its concerns can only confuse the president and distract him or her from effective functioning.

2. The president must be educator and teacher to the institution's various publics, but especially the board. Unless a board is confident that the president is informing them of the significant issues confronting the institution, enlightened board members will seek such information elsewhere. A measure of the president's leadership ability will be the board's active concern with the vital issues facing the institution and its well-being.

3. A president should avoid any private or personal agreements with individual board members. The president should be free at all times to take a position based on his or her best judgment and not modified by prior commitments that cater to the personal interest of a board member. Similarly, board members should avoid personalizing their concerns and acting as though a president's refusal to support a pet idea is a repudiation of their own worth. The essential purposes and value of the institution to society should be the bench mark against which all matters are decided.

4. Boards should assume that problems and conflicts are part of the normal day-to-day functioning of any institution. They should not react overly to "bad" news that the press or other media may choose to publicize. We should have long ago overcome our fantasies of campuses as Gardens of Eden and the innocence that accompanies such images. Institutions are communities and, especially with limitations on resources, they are communities in conflict. Appropriate procedures and processes for dealing with that conflict, and leadership that does not allow that conflict to become a substitute for purpose, are what boards must insist upon. They cannot insist on the absence of conflict.

5. Finally, the board must assume responsibility for the working conditions of its president. No one else will be able to respond to a president's need for staff, adequate housing conditions, health, encouragement or uplifted morale. If the board does not care about the welfare of its president, it will get what it probably deserves--a president who doubts the value of expending himself or herself on behalf of the board and its institution.

The Coordinating Board's Role

Most of this report concerns the individual institutions and systems of institutions in Texas or elsewhere. Naturally, the Coordinating Board can provide leadership and incentives for such objectives as it supports. But I believe that the Coordinating Board itself could do some things to strengthen the quality of administrative leadership in the public institutions of Texas.

It could, for example, stimulate and provide support for staff development in the institutions. This would require some minimal funding or sharing of resources. It could aid in the identification of administrative talent, providing the machinery or structure whereby those who wished to participate in administrative advancement activities would be provided the opportunity to do so. This might include various statewide "in-service" opportunities for present and would-be administrators from among the institutions' staff and faculty. It would mean some demonstrable efforts to show the Coordinating Board's belief in the importance of supporting quality administration and quality administrators.

I am mindful that administrators may not be interchangeable among the separate institutions in Texas. Yet many see themselves as colleagues and could join in concerted staff development efforts. Recognition of their role and worth by the Coordinating Board could be helpful in both a functional and symbolic way. That would be true for all senior administrators, but especially true of presidents and chancellors.

Conclusion

There are many unique aspects to the role of college or university president. At the peak of one's accomplishment and career, one is placed in a position of total vulnerability. Often, giving up security and faculty tenure elsewhere, one uproots one's family and agrees to do a job that may only last from five to seven years, on average. Then what?

After three or four years, most presidents worry a great deal about what they will do next. They do not have job security, even if they could maintain the pace and withstand the stress until retirement. This concern is especially serious at the age of 57 or 58, when starting a new career may be precluded and remaining as president may seem precarious. We shall need to have compassion for this condition even as we must insist that presidents serve only as long as they can be truly effective.

As the role of president becomes more and more temporary and lacking in security, we in higher education will need to discover incentives to attract the quality of leadership so greatly needed. Increasingly the many disincentives are complicating our choices. People committed to humane values and human growth must be the leaders of our educational enterprise.

I believe colleges and universities to be important to our future and to our freedom. I also believe that administrators and presidents are important to our colleges and universities. We cannot take for granted that good people will aspire to serve in such positions. Rather we must purposefully recruit, select, assess and reward such persons if our institutions are to be capable of renewal and, thus, service to our citizens now and in the future.

NOTES

[1]Peter F. Drucker, Managing in Turbulent Times, New York: Harper & Row, p. 133.

[2]Kenneth H. Ashworth, American Higher Education in Decline, College Station: Texas A&M Press, 1979, p. 89.

[3]Barry Munitz, "The Chief Executive Officer and the Administrative Reward System." National Forum, Spring 1980, Vol. LX, No. 2, p. 11.

[4]James MacGregor Burns, Leadership. New York: Harper & Row, 1978, pp. 425-426.

EDUCATION FOR THE FUTURE

by John D. Moseley

Assignment and Approach

My assignment is to prepare a paper on the "Education for the Future" to be a "think piece" and to serve as a part of the background for the Coordinating Board's planning process for the coming decade for Texas higher education. One more opinion or view on what education will be in the future may not be as useful as a staff paper type of analysis and discussion of the future.

Therefore, I propose first to look at the perspective and problem of dealing with the future, second to look at some of the implications for education, third to look at some of the special problems and opportunities of the Coordinating Board and Texas in dealing with the future of education and finally some possible strategies that might be employed to face education for the future more realistically.

The Perspective and Problem of the Future

If we are to think about "education for the future," we must begin by thinking about the future itself. This is not easy; generally we are so burdened in our thinking with the present problems and pressures, and with the heritage of our past, that it is difficult to think in the future tense. It may help us to realize that our present was the future of our past; i.e., the Coordinating Board's future planning and decisions at the beginning of the 1970s have now become the present 1980.

We can be sure that our society, and our world, is changing so rapidly that the future will be different from the past and present. Also we cannot be certain or know with any accuracy what that different future will be like. The decisions we make at the present, whether we know it or not, will be in some measure determining that future--at least in opening and closing options. The quality of these decisions and our human ingenuity may be the only answer to the survival of the human race.

Examples of Areas of Major and Global Concern

It may assist us in this paper to have some examples to indicate the dimensions of the major problems with which people working on the future are concerned. One of the best examples of these concerns is in the Club of Rome which became famous for its report on the limits to growth. Now it has a new report, No Limits to Learning, that focuses on the human gap and potential. It characterizes our situation as follows:

> Only ten years ago, the mood was one of great expectation. Now, after a decade of global issues, it appears not only that the world situation has substantially deteriorated but also that adverse trends are steadily strengthening. Even though the techno-scientific enterprise has progressed on many fronts, its achievements

> are neither systematically nor globally coordinated, all too often engendering more serious problems than the ones they solved. Meanwhile, still other problems of political, social, and psychological character keep emerging. All of these intertwine so that the predicament of humanity becomes even more difficult and the overall human condition continues to deteriorate...
>
> Never is our vast assortment of resources mobilized across academic disciplines and national boundaries with the view to pursuing common, global goals on a long-term basis. As a consequence, humanity is pitifully unprepared to cope with the formidable challenges, threats and complexities on the immediate horizon.

Different futurists would describe these global problems with somewhat different emphasis, but they would be in agreement with this complexity and global nature and local importance. A recent conference of the World Future Society with over 4,500 participants from 50 nations in Toronto had as its theme, "Thinking Globally and Acting Locally." The following are some examples of these global issues of concern:

1. Population. Our world population in 1980 has reached 4.3 billion and is increasing at 70 million per year. One estimate is that it will double to eight billion within 35 years. A United Nations medium-level population projection shows that population will not level off before a century or more--at 21 billion. Of course, this fundamental problem of population sets in motion several of the other global concerns regarding the resources, food, jobs, energy, etc., required to sustain such population growth.

2. Allocation and Use of Resources in Meeting Human Needs. The dramatic need in terms of hunger and the need for food for the present population is a major unsolved problem with one-third of the population living beneath the poverty level. This involves the issues of the use of crop lands, grasslands, forests, fisheries that supply the needs for food, clothing and shelter. It also involves the earth's energy resources, and recent events have made our nation aware of the basic nature of energy not only to our economy but to our very way of life. These issues also raise questions of the ecology and the change in our environment that are the real concerns of many.

   The priority and the use of scientific and technological developments are crucial as these resources are dealt with. All of this is related to our priorities and decisions in the exploration of space, solar energy and the oceans as they may become additional major resources.

3. The North-South Cleavage. We tend to think of world conflict along East-West political lines, but increasingly divisions are forming along North (developed and rich nations) and South (underdeveloped and poor nations). The North with 80 percent of the world's wealth and trade, 85 percent of the world's resources that are spent on education and nearly 100 percent of the institutions of research indicates the imbalance. This imbalance becomes evident with the impact of worldwide communication systems and the growing expectations and demands of the "have nots" and presents

a growing cleavage and conflict that must be recognized and with which we must deal.

4. War-Peace--the Threat of World War III and Human Oblivion. Here is the way that No Limits for Learning described this issue:

> The world has become an armed camp, and the arms race continues to spread from the great powers to scores of other countries, including the poorest. The nuclear overkill capability has obtained absurd levels. The entire world population can now be wiped out many times over. Two-thirds of the non-nuclear countries are importing major weapons. Almost half of the world's scientists are engaged in "defense" projects, and the annual military expenditure now exceeds one billion dollars a day. In 1976, the world spent 60 times as much money to equip each soldier as it spent educating each child.

Several things need to be said regarding these global issues as one thinks about the future. They demand a holistic approach and a way of thinking about the world and its problems in this total context. These problems are interrelated and not only affect one another, but also one may depend on the solution of another. Although they are serious world problems, they are becoming local and affecting our daily lives. These global problems say a lot to us in education concerning the need for a holistic perspective, the content of our curriculum, the priorities of research and the contribution and service needed for the solution of such major global problems from education.

Changes in Lifestyle and Societal Conditions Affecting the Future

Another whole set of forces that futurists are concerned with has to do with the technological developments and the social changes that are going to affect the way people live in the future.

1. In the extremes are discussions and models of living in space, with cities built in space that are maintained as major contained units. This is for many a very distant and doubtful future; yet there is considerable evidence that with the space shuttle providing cheaper and more regular space transportation some commercialization of space will be a result in this decade, and this is already evident with the communication satellites. Certainly major efforts at resource development, solar energy and space exploration are the decisions for this decade and will be major factors in our future.

2. Almost as dramatic is the information explosion and communication revolution and the effect it is having and will have on our daily lives. This is the result of our research and the expansion of knowledge in all the different fields. It is expanding exponentially, which implies a high rate of obsolescence. How does one ferret out the current information he needs? As a result of our technology, especially in terms of communication and the computer, revolution in the storage and retrieval of information is underway.

We are projecting paperless offices, pocket computers and wristwatch telephones that will make information and communication immediately available. All of this has implications for how we work and what we learn and how we live.

3. The pluralism in changing values of our society is already painfully evident in our own nation, not to mention when we consider the global situation. The changing role and makeup of family as a basic unit of society, the new role of women, the two-income family, the divorce rate, the single-parent family are all evidences of this change. The changing sexual standards and morals, the "me" generation approach, the difficulty of obtaining common national or even community goals, one-issue politics, the aggressiveness and reform role of government in equal quality of opportunity, the attempted assurances of social and economic justice, all of these and more are changing the way we live and operate our institutions and society today; and surely these forces are determining an even greater difference in the way we will live in the future.

   There is also a growing feeling of powerlessness on the one hand and a feeling of the right to participate in the making of decisions (especially public policy) on the other hand that is going to affect the life of the individual and our governmental processes. We have a great deal to learn in the handling of the various ideas and values of the pluralistic and participatory society and at the same time live together in a local community and the global community in peace and prosperity.

4. Another major group of forces that is affecting our lives and portends to do so even more in the future is created through science and technology. Some futurists would see many of the global problems (and, paradoxically, their solutions) in scientific and technological development. Others would see these forces as being major causes of concern in depleting resources and dehumanizing people.

   Scientific developments in one field have many and unique applications in another field. In one such example, what we learned from our space program in science and technology has had application in medicine and industry. The scientific developments in the area of medicine and health care are dramatic examples in the finding of cures for diseases; increasing understanding of genetics, molecular biology, aging, environmental conditions, etc.; and the potential effect these will have on human life in the future. Major shifts of emphasis to preventive medicine may give understanding of different ways of living and of longevity and may make our future operation quite different from our past and present.

   As we recognize both the global forces and those more specifically affecting our individual lifestyle, we need to repeat the need for seeing these issues in complete context (a holistic approach). This context includes the interrelationships and accumulative nature of these forces, the fact that these global problems do become local and affect our personal lives and that they all become important factors in determining our educational needs for the future,

both as individuals and for our society. These educational needs and the future are the topics we now address.

Human Ingenuity and Education as a Major Factor in the Future

Academic Research and the Strategy of the Future

In academic circles it is not very popular and is somewhat of a high risk to commit your scholarship to the future. It is understood to be much more academic and scientific to work on the past or study the present in terms of society or physical phenomena.

This type of research is the basis for gaining new understanding into the nature of things and has made possible the explosion of knowledge, especially in the last 25 to 40 years. Often it was possible in the analysis of present problems and phenomena to project those findings into the future. This generally gave us a straight-line projection of the past conditions and phenomena, not taking into account any other condition or interrelationship with other or new factors.

There has been a trend to approach the future as if it were a separate discipline. This has not been universally accepted in academia, but the subject matter has had a growing recognition over the past two decades. "Futurist" programs are being included in the curriculum. Professors who have specialized in bringing together various aspects of future studies from various disciplines are being increasingly recognized--sometimes within a department or in a specialized organization or center.

There is an increasing network of people concerned with and writing about the future both at the serious scholarly level and particularly at the science fiction level. The latter is interestingly imaginative but tends to develop in the popular mind a kind of writing-off of the more serious work on the future issues and planning.

There are new attempts at coordination and focus for future studies. In 1966 there was an effort made to establish an unbiased forum and clearinghouse for scientific and scholarly forecast investigation and intellectual exploration of the future. The World Future Society, an association for the study of alternative futures, has had tremendous growth, demonstrating the interest and concern for the future. They now have 50,000 members in 80 countries from all the professions, including leaders in business and government.

It is interesting to see how many of these concerns with the future, in terms of the scientific, technological and material aspects of the problems, are now turning their attention to the human aspects--their values and the human capacity to be inventive and solve problems. One of the best illustrations of this has already been mentioned in the Club of Rome report in 1972 which concerned The Limits of Growth and now the recent report on No Limits to Learning--Bridging the Human Gap. Look at these quotes to get some feel for the new thesis of concern for the human gap and learning.

> The human gap is the distance between growing complexity and our capacity to cope with it. Clearly, one eternal human endeavor has

> been to develop additions to knowledge and improvements in action to deal with a complexity which, for the most of history, derived primarily from natural phenomena. An essential difference today is that contemporary complexity is caused predominately by human activities. We call it a human gap, because it is a dichotomy between a growing complexity of our own making and a lagging development of our own capacity...
>
> This report examines how learning can help to bridge the human gap. Learning, as we shall use the term, has to be understood in a broad sense that goes beyond what conventional terms like education and schooling imply...Practically every individual in the world, whether schooled or not, experiences the process of learning--and probably none of us at present are learning at the levels, intensity and speeds needed to cope with the complexities of modern life. Distinguishing this notion of learning from schooling does not mean that this report will ignore education which is a fundamental way and formal means to enhance learning...
>
> Serious doubt must be raised as to whether conventional human learning processes are still adequate today...Maintenance learning is the acquisition of fixed outlooks, methods and rules for dealing with known and recurring situations. It enhances our problem-solving ability for problems that are given. It is the type of learning designed to maintain an existing system or an established way of life. Maintenance learning is, and will continue to be, indispensable to the functioning and stability of every society.
>
> But for long-term survival, particularly in times of turbulence, change and discontinuity, another type of learning is even more essential. It is the type of learning that can bring change, renewal, restructuring and problem reformulation--and which we shall call innovative learning.

It is interesting to see those concerned with the future and the way they have concentrated on the scientific and technological problems and solutions of our global and lifestyle issues are now turning to recognize that the real hope of the survival of the human race lies in the capacity, ingenuity and learning of human beings.

The distinction between maintenance learning and innovative learning has many implications and is a useful way for us to think about the different kinds and uses of education or learning. It helps us think about the kind of education the individual needs to cope with the changing world and what kind of an educated system the society needs to maintain itself. It may also help us think about the difference in the kind of education and how it is acquired to meet the needs of the future.

Education of the Individual

As we look at the global and lifestyle changes that the future may hold for the individual, we can imagine quite a different set of conditions and educational needs the person will require to live in the 21st century. That is not as far off as it may sound, for the children now two years old will be

in the college graduating class of the year 2000 and spend their adult lives in the 21st century.

Think of the education of the class of 1900 as a contrast when there was a fairly manageable body of knowledge with largely a standard set of courses (more likely courses in Greek, Latin, literature, mathematics, moral philosophy, physical science, etc.) which everyone took whether their ambition was to be a teacher, lawyer, doctor or minister. Elective courses had not arrived and there were only 250,000 students nationwide. As we visualize the turn into the 21st century, we will have had the information explosion and the development of communication technology that makes tremendous amounts of information available to the individual. We will also face the continual changes requiring coping skills possibly dealing with options of space frontiers and possibly regular and new global contacts, understandings and operation with instant communication and travel. We are already seeing the need for the understanding of world cultures and languages, and this is to become a more universal education requirement of the future.

Thus we may need to think about the nature of the individual's educated task in different terms. Generally we have focused over most of the 20th century on the development of subject matter and have organized our research and teaching in academic disciplines. This has been one of the reasons for our expansion of knowledge. We have generally expanded the disciplines by dividing and creating new courses to accommodate the expanded knowledges in the discipline. In many cases we have had then to subdivide the disciplines or at least to create specialties within the discipline.

One professor recently making this point said over his lifetime his discipline (department) had made 13 subdivisions. This approach has taken care of the interest and needs of the professor--what about the student? The student cannot possibly take all the courses even in his major field, much less in related fields and for general education needs. Generally the student is left on his own to integrate the information and knowledge into some kind of meaningful or total perspective.

If we focus our thinking on learning and the student instead of the subject matter and the teacher, we begin to see the educational task in something of a different light and possibly develop different guidelines as to roles and tasks. We generally talk about "lifetime learning" from the standpoint of needing to continue one's education and update information and new professional techniques, etc.

What if we take the lifetime learning concept seriously, turn it around, begin at the beginning and attempt to provide these kinds of educational opportunities at the early stages of the person's development and educational needs? This might make schooling (K-12, through college and professional schools) take on quite a different and flexible character, and the vertical integration of one's education might be a surprising saver of time and cost and provide quality for the needs of the individual.

This might force us to think differently about the different kinds of education needed for different people. This might require different standards for judging the excellence for one need versus another. It might require specialized educational programs to meet certain educational needs. We do some of this now, but we generally think of a BA degree as

about the same as any other BA degree. And generally our curriculum is comparable in meeting academic and accreditation standards.

We do this because we think about the subject matter and the professor teaching the courses that are thought to cover the field and are required. Is the need of the student to live in the 21st century or is it to go on to graduate school (and probably get a PhD like the professor)? Is this need the same for each student? The program and curriculum are exactly what should happen for those going on to be a PhD and a professor.

Most people are not going to be PhDs and professors, yet most of our academic curricula are built on that rigid way of thinking about the required knowledge. How much of that knowledge (information) is vocabulary and facts that are needed as tools and language of the discipline? Much of this may in the future be available to the student in other electronic forms and available at the student's own time, pace and possibly place. Yet how much of the knowledge (wisdom) is from asking the right questions, thinking in dialogue, with ideas, creative innovation and motivation? This creative thinking and concern for values becomes the essence of the future role of the professor that no computer or electronic recording can replace. This may be the distinction between the maintenance learning and the innovative learning I quoted above.

Thinking about "lifetime learning" from the individual standpoint also makes us think of that learning in non-school terms. There are other educational delivery systems (not the usual institutional classroom) that capitalize on self-directed learning, resources available in package courses of cassettes, experiential learning assessment, correspondence courses, etc. There are also some classrooms that are not the traditional school or college; i.e., industrial training programs, military educational training programs, for-profit educational courses, professional and association continuing education programs and industrial colleges.

With the cost of traditional college education increasing, with increasing availability of alternatives in delivery of educational resources, with the mobility of the population and the reluctance to forego years of income, will the concept of "lifetime learning" really catch on and make a substantial difference in the system of education? Will a person get the education, the learning, the skills that are needed as they are needed? May they cost less and be appreciated more if each is used as needed?

This approach is discussed by Richard Bolles--Three Boxes of Life and How to Get Out of Them --in which he describes the phases we go through as "boxes": first education, then work and finally leisure (or retirement). He argues we should cut it the other way and have some education, some work and some leisure as we go through our lives with careful attention to our values and balance using a lifetime of learning concept. If this is increasingly accepted by our society (for various reasons), it may substantially change our schools' approach and require much more flexibility and creativity.

It seems evident that with the pluralism and individualization of our society and the changed educational needs that the higher education system must change and be more flexible and responsive to meet the individual needs and the future.

Educational Needs of the Society for the Future

We may use the distinction already made to characterize two of the main educational needs from the standpoint of society. One, which is the idea of maintenance learning, is a basic necessity for society to continue and maintain itself, its culture, citizenship responsibilities, methods of operation, rules and outlook. This is basically what our schools are designed to accomplish. The other requirement for innovative learning we do occasionally in some areas, particularly in some of our research and some of the problem-solving and crisis situations.

If this distinction is applied to the U.S. public policy, it is clear our emphasis has been on the former, with wide access and providing the individual educational opportunities. However, many new clear-cut understandings of the educational program, its mission and task and individual needs they were designed to meet will be a prime necessity. This will mean more clearly defining program tracks which will be necessary for all students, especially those that will not be going on for the PhD. The larger the volume of students, the more likely that the volume business of higher education will be this basic education and learning for the maintenance of the society. It may call for more careful distinctions, program tracks and special research to be designed for the innovative learner.

In addition to the education of the individual and providing society with the informed citizen to maintain itself, society must have the kind of research that is pushing back the frontiers of knowledge. The national policy has been primarily not to have major government research organizations but rather to depend on universities and specially related research institutes and organizations and industry for such research. This has put universities in the forefront of new knowledge and has been effective in producing new scholars through the graduate studies and research.

There are trends, however, that could portend that much of the future research may not be in the university. This is in part because of such major expenditures for complicated and expensive scientific equipment and future requirements that will be brought together in research centers where scholars will work. This may pull many scholars away from the university. There is also the problem of the priorities and funding of the research by the society. This is a major issue, especially in terms of future, i.e., space, solar energy, coal, environment, etc. What priority for research and what funding? These are pressing current problems, but the answers are determining the future.

Given the pluralism of the society and the increasing demand for participation in public policy decisions (especially when these are affecting the life of the individual), new forms of government, participation, representation and skills of leadership must be developed as we move into the future. Much of this methodology may be affected both by the new technology and the kind of education that is provided for the future.

Society must have an overall understanding and system to provide the education for the future that includes not only its educational institutions, but also utilization of the resources of all forms of communication, media, technology, learning opportunities and experiences on and off the job, through family, church, school, etc. Undoubtedly much broader attention will have to be given to the kind of educational system necessary to provide

society with its educational needs for the future.

Problems and Obstacles Concerning Education for the Future in Texas

As we think about the future of education, we need to recognize that something fundamental happened in the mid-1960s that changed the American system of higher education. The President, and the federal programs, established "universal postsecondary education" and began providing funds so no person would be denied access to the education the person needed beyond the high school. This opened the gates and established open admission policies for many colleges. It also put pressure on states to provide the faculty, facilities and programs, and we have doubled again the size of college attendance.

Postsecondary vs. Higher Education

Note that postsecondary is not a synonym for higher education. It is a much broader concept and operation. Also note that some of the larger number increases were in the community college expansion and in the professional and graduate programs which began to demonstrate an increasing concern on the part of students for vocational education.

Two major problems in regard to our thinking about the system that have not changed: One is that we still think about all of the postsecondary education as being alike in institutions, and we have not made the distinction between different kinds of educational needs for different individuals and groups nor how different institutions have more distinctive missions and programs to meet those needs.

Second, we have not realized that opening the access to higher education (as a part of postsecondary efforts) has in many cases changed the character and the quality of education in some institutions. One college that was noted as a very high-quality scholastic institution in a short period of time became very egalitarian and modest in scholastic quality, largely because of the capability of the students admitted under a completely open admission policy. This was a dramatic case, but one could find classrooms where the same forces applied to the quality of the education.

As we think of the Texas system of higher education in light of these broader issues, the future and the educational needs, we are struck with many problems that must be faced, the many difficulties involved and the many necessary changes to meet these challenges for the future.

Two ways of thinking about the design of the system of Texas education might help to think much more specifically about each part of the system (community college, state university, independent college and university, priority education) and within that even more specifically about each institution and its programs designed to take care of the specific educational needs of specific groups of people. This way of thinking would differentiate between the different kinds and tasks in education (job training, acquisition of skills--maintenance learning versus innovative learning, creativity, anticipatory learning, etc.), the way and the time people need to acquire the various types of learning and how each of the institution's missions and programs is geared to meet the specific needs.

The other way of thinking would be more in terms of the total Texas system and how all of those pieces would fit together in behalf of the total state need for its citizens and for providing leadership for the future. This could involve more attention to the educational function and fitting together the role of each sector on the one hand (community colleges, regional and research universities, independent sector, etc.), and more of a regional approach on the other hand. How could the educational needs of a region be met by fitting together the total educational resources of the region? This regional approach would involve cutting across sectors and providing for cooperative devices of delivery of education to meet the needs of the region. Of course, many can think of reasons why such ideas "won't work"; but with some imagination and a few adjustments in legal and financial techniques and incentives, clearer assignments of role and scope might provide a better fulfillment of future educational needs more effectively and economically.

Management vs. Planning

Maybe as we think about the future, we need to think about the operation of the system now and how it may need to operate to meet future needs. Do we need to think more specifically about the planning (long-range needs, issues, next steps) as distinct from the management and operation of the system? For example, is the Coordinating Board so involved in day-to-day, short-range and "next-legislative-session" work that only in the beginning of each decade does it allot some staff time and its own energies to the task of really looking ahead and doing overall planning?

The management problems are so great at the present because of demographic and inflation pressures from the outside and the inside (of just the state system and institutions, not to mention the independent and proprietary sector) that we may be ignoring more basic questions of educational tasks and directions. We may be making buggy whips more efficiently than ever before but disregarding the need for buggy whips.

Let me translate that into a modern illustration from a conversation I had recently with an industrialist. His company (a relatively long-established, family-held company gone public) is at the present at its peak of success making money, has a large group of very capable high technology people, is just doing great. They have just begun a major planning study on what they should do for the future, for they see their high technology field changing and maybe becoming somewhat obsolete. What do they do? Do they ride it down and make all the money they can? Retrain their people for new technology, new research, new roles and tasks to meet new needs? This industrial situation may be more parallel to our educational system than we may think.

Some of our present efforts at management may be making us more efficient at doing things we ought to be changing or at least doing a very different way. Also, we must realize that the style of management has and is continuing to change increasingly. Management must be less a matter of decree and more a matter of shared commitment to its importance, personally and institutionally, with incentives and flexibility to accomplish the goals and with a certain kind of quality and diversity. Yet it must have accountability.

This may mean finding techniques of delegation and incentives for the

various educational sectors and institutions to do their management in different but effective and efficient ways. They must be more accountable for the end results of the assigned educational task than for following a particular management approach or principle or standard program operation.

This thinking about management puts in contrast some thinking about how unique the assigned role of planning regarding the higher education is to the Coordinating Board. Although others (the governor, legislature, legislative budget board, the university systems, individual institutions, federal government accreditation agencies, etc.) may be involved in the operation of the system and in many of the decision processes to make it effective, the Coordinating Board is the one designated to make plans for the Texas system of higher education with specific instructions to include in its planning beyond just the state-controlled institutions, i.e., the private sector. The Coordinating Board was set up to be somewhat independent so it could exercise its judgment and vision of the future needs without undue institutional or political pressures. That way it could secure and serve the long-range best interest of Texas in terms of the needs of its citizens and the state for higher education.

The other side of that planning assignment through the Coordinating Board is that if the Board doesn't do it, no one will. Or, if planning proposals are made, we get a reaction to them in terms of "vested interest" or "limited vision" rather than a holistic view and an understanding of the present and future needs of the system for the state and its individual citizens. Even if the Board has good planning intentions, it may get so swamped with details of operation that, as happens with many executives, the planning gets put aside until there is time and often goes undone. We may find it too late, decisions made and we can't take advantage of certain options that might have been provided for a better future.

To think one is responsible for the future is a frightening and awesome reality, especially as we have thought about the future and the educational needs it may entail. Indeed it is impossible to blueprint that future and just how it will be or even develop. Yet to throw up one's hands and to ignore it is to set Texas higher education adrift and subject it to the variety of current and changing pressures. Yet there are ways for the Coordinating Board to exercise its primary leadership role to help get a vision and challenge to both those involved and to the citizens of Texas whom the Board serves.

It may not be easy, and the directions and answers may not be as clear nor as desirable as some might want; but without that process of planning and leadership, the State of Texas cannot provide its citizens with the education they need nor the state with the leadership it must have to meet the future opportunities Texas has for a national and world leadership role. What kind of processes or strategies are available for the Board for planning education for the future?

Possible Strategies for Planning

We have looked at the global problems, the uncertain and unknown nature of the future, the forces that are changing the lifestyle of the people and the changing needs and tasks of education. We have also looked at some of the problems of our educational system and the difficulties we may encounter

in changing to meet the new demands and opportunities of education for the future. We come now to think more specifically about what the Coordinating Board can do to fulfill its unique responsibilities of leadership and planning for the future of Texas higher education. This would seem to call for some thinking about a planning process as contrasted to some kind of fixed blueprint plan. Such a process could involve several parts or strategies that would serve the Board.

Strategy Objectives

The Board might think of the objectives of such strategies along the following lines:

1. A strategy for keeping itself informed about the future and to establish a kind of future-oriented context (framework) in which to make both directional and current decisions related to education for the future.

2. A strategy that would raise the future-type questions, suggest possible directions and challenges and receive information, critiques and suggestions from various related sources to assist the Board with its planning of education for the future.

3. A strategy that will keep key officials and groups informed and properly involved and assisting the public understanding of the problems and opportunities involved in planning education for the future.

4. A strategy or Board process that every so often (five to 10 years) brings together and updates the directions, the progress made, the issues and challenges ahead and seeks understanding and support for those plans for education for the future.

If one accepts these general objectives or directions for a strategy or planning process, what techniques or working arrangements will accomplish these objectives for the Coordinating Board? How does the Board think about these tasks in more specific terms?

Assignments and Resources for Future Planning

Possibly the Board needs to think about its own role and set an example by its concern for the education for the future--perhaps by the adoption of a goal of making its decisions in the context of a real concern for the future with the determination to keep itself informed concerning these matters.

Maybe the Board in the first place would appoint a small subcommittee (two or three members) which has a special interest in the future and planning. They would dedicate some of their work to keeping informed and to raising the future questions for the Board.

Maybe in the second place the Board would instruct the Commissioner to be personally responsible (with possible staff assistance) to keep the entire Board and subcommittee regularly and specifically informed about issues and basic information regarding the future. In terms of long-range planning,

the Commissioner would plan for certain meetings or sessions of the Board to be devoted to thinking about the future and planning.

Realizing that the Board is already pressured with a great deal of staff work load, it may be possible to design a strategy to get more staff work done on future and long-range planning through special arrangements and contracts. There are many resources in higher education, in government, in industry, etc., that are doing work in terms of the future and may be utilized by the Coordinating Board. Part of the job is a matter of collecting such data and reports and having this information available. It is also possible to contract with people who have real capacity and interest, who are already involved in some of these issues and who could be persuaded to provide the Board with data, insights and suggestions. Such contracts also can be used to create a new interest in the future by certain capable people or organizations, and it also can be used to secure cooperative efforts with various groups.

It should be recognized, however, that there is a major task to pull together all of the various pieces and to relate all of this information and these suggestions into a holistic view of the total system of higher education in Texas. This is not an easy task, but it is possible with some skillful coordination, staff work and selection of appropriate alternatives by the Coordinating Board possibly through its subcommittee work.

Another major strategy is the use of advisory committees to assist in dealing with education for the future. There are at least two major ways that advisory committees may be used and at different levels. They may be used to secure advice and also to inform those that should be knowledgeable and to get their involvement in the process of thinking about the future. It is also possible to think of such a group as a broad, citizen-type of group for advice in judging which directions might be best followed and in securing the support of such a group in gaining citizen understanding and assistance. The other level of advisory committees could be more at the staff or working level. This work could be at several levels: for example, at the level of presidents of institutions to help gain understanding, suggestions and leadership for dealing with the future; it might be at the level of faculty leadership as programs are rethought to meet the needs of the future; and, finally, it might be at the level of the individual specialist who is providing more detailed information and suggesting alternatives.

These suggested strategies are certainly no prescription for the way the Coordinating Board should establish its process of planning. It is hoped that the Board can reappraise the importance of this planning for the future responsibility and design an approach and strategies of operation that are adequate to accept the challenge of the future for Texas. The Board should be warned, however, that planning for the future can be a great boondoggle--a process of reducing everything to hard numbers and quantifications, writing endless papers and never seeming to get anywhere. The Board, the staff, the educational institutions do not need this extra burden. On the other hand, good planning can give perspective and direction to the current operations and prepare us for the future.

Planning can also be primarily a way of thinking about the future and how that future is being determined by the present decisions. It can be a way of securing and thinking about policy development and research getting

very necessary facts and trends while looking at the values and alternatives to assist the Board in assessing the risk and determining the proper direction for education for the future.

The Coordinating Board and the leadership it gives in planning the education for the future may be the most important factor in determining the future role of Texas in the nation and in the world.

MEDIA AND EDUCATIONAL TECHNOLOGY IN THE '80s

By John E. Fryman

Introduction

"The trouble with our times is that the future is not what it used to be."

--Paul Valery

Having been asked to provide some insights into the past, present and future role of media and educational technology as an arm of higher education, we have been privileged to speak with some of those who know the problems and the promises from clear and daily associations with the tools, the practices and the problems.

What we have discovered and what we have to report will not necessarily cause the future to come upon us any more easily. But there are some basic observations which can be summarized even at this early point:

1. We, in Texas, will employ the tools and techniques of educational technology in higher education--especially those related to transmitting the electronic signal; or

2. we simply will be unable to accomplish the tasks of higher education; and

3. in the absence of any action in this area by those decision-makers in Texas, someone else outside the boundaries of Texas will develop the tools and the techniques for us.

There is probably no one greater threat to the existence of an educational institutional structure than the prospect of ever-increasing overhead costs tied to questionable student enrollment growth. Inevitably, the backwash of these restraints are to be sensed in departmental financing, in research allocations, in faculty salaries and recruitment practices, in the availability of new equipment or plants and the replacement of the old. In short, the continued operation of educational institutions as we have known them will simply cease to be.

We are presented with a set of problems coupled with a dynamic array of potential solutions. This paper is an attempt to paint a canvas of what could be--especially in the coming 10-year period--if the educational media specialists and the technologists were freed to exercise their craft in the widest possible manner; if budgets were freed of old-style formula restrictions in order to equip adequately those locations and spaces easily accessible to our people; if new reward systems were devised to compensate adequately the great expenditure of professional effort required to implement the technology; and if the policy-makers and opinion leaders were aggressively to support the intelligent and nonparochial integration of the available and proven technology into a plan for higher education.

The pressure of inflation and increased demand for education will drive us toward development of innovative ways to serve more people at a lessened

cost per unit of service provided. Inevitably, these pressures point toward further integration of electronic technology as one proven method to accomplish the task. As we will declare many times in the following pages, the widening impact of cable and communication satellite signal processing shows promise of transforming these integrations from dream-world fancy into hard, financially rewarding reality.

The products and the services are coming. The "wired nation" so broadly theorized a decade ago is here. Satellites are overhead and transmitting messages down to us without ceasing. The system has been turned on.

The complex question is just this: will we turn on our own part of the system, or will we, by default, leave it to someone else?

Electronic Media in Texas

Since its early beginnings in Texas, broadcasting has steadily climbed in commercial importance to the state's economy. At this time there are 307 standard broadcast stations, 220 FM operations and 36 television stations. Of these stations which are commercially operated, more than $2 billion is contributed to the Texas economy.[1]

Texas is served, of course, by the major national radio and television networks, while its importance as a filming center for theatrical, made-for-television and motion picture production continues to climb.

The development of cable television systems in Texas promises to revolutionize the media habits of a large portion of the state's population. There are 408 cable systems in operation in Texas with approximately 990,000 subscribers.[2]

Educational Broadcasting in Texas. Texas received some early distinction in the development of educational television activity when the nation's first educational station, KUHT at the University of Houston, went on the air in 1953.[3]

Presently there are eight educational television operations in the state, some directly associated with institutions of higher education, others locally operated by nonprofit public broadcasting organizations.

Nonbroadcast Activities in Texas. The use of a variety of networking techniques has had a profound effect on the development of nonbroadcast patterns in Texas. Microwave networks, ITFS (Instructional Television Fixed Service) and the proliferation of use of videocassette all have contributed significantly to improving and extending communication possibilities within the state.

Yet in answer to the educational needs of the public, the use of educational technology has been somewhat less than thrilling. The reasons are many, most of them stemming from education's inability to generate revenue in any way comparable to that of free-enterprise, advertising-based entertainment broadcasting. Educational uses of the media traditionally and historically have fallen upon the public purse or the generosity of citizens and philanthropic organizations, along with large corporations, as the principal sources for technical plant and program production funds.

In the early '70s there was an effort to develop the Information Network Associations of Texas, which would have tied together the majority of Texas

junior and senior public colleges and universities in an electronic network. Due to a lack of state funding, however, the development of these networks was never realized.

During the mid-1970s there was a widely based effort toward acquiring a satellite communications system for all agencies of state government. Although many meetings were held and some basic research accomplished toward that goal, the project did not materialize.

In the absence of a statewide plan, therefore, educational uses of the media in Texas generally have adopted a parochial or insular stance. Only recently has there been an outward push through the efforts of the TAGER (The Association for Graduate Education and Research in North Texas) and The University of Texas Health Science Center in the Houston area. Although other smaller examples do exist here and there throughout the state, none are of adequate innovative or widespread service to warrant their emphasis as a bellwether for new applications.

Applying Technology Toward Solving Some Problems.

One geographic area of Texas boasts two examples of the successful application of available technology toward surmounting local problems in educational access.

The combined work of the Dallas County Community College District and the Tarrant County Junior College District, along with other institutions outside of Texas, provides a living laboratory of application of late technology alongside maximized interinstitutional cooperation. Their efforts have served successfully the special needs of North Texas area students with an increasingly high-quality educational product, while bringing together the best minds from across the nation in new applications of educational technology and design along with proven efficient use of public funds.

Meanwhile, the TAGER network, now into its second decade of operation in the North Texas area, has demonstrated amply how an independent agency can become a central point of contact between the public and private educational sectors, serving not only the needs of its academic member institutions through sharing of faculty and facilities, but also filling the continuing educational void in the industrial, scientific and business sectors.

We shall briefly describe each of these well-grounded efforts.

The Dallas-Fort Worth Evolution. In an increasingly diverse society, the search for alternate educational delivery systems has proceeded without ceasing, even in the face of continuing administrative and attitudinal obstacles. And the search for more effective uses of the electronic signals as the carrier of these products has provided a proving ground for innovation.

From a volume recounting the developmental history of this cited activity comes this:

> During the first six years of instructional television, DCCCD's production and implementation of telecourses has greatly expanded and improved. From the initial production of a single course, the DCCCD roster now includes several completed college credit tele-

> courses and several others in various stages of production, design, and planning. . . The once exclusively open circuit broadcast delivery for Dallas County residents now encompasses several different delivery modes, both open and closed circuit and on- and off-campus, a regional consortium, and an international distribution.[4]

A "telecourse" includes the television materials, in addition to a massive array of supportive materials and student services: a carefully written study guide to accompany the required textbook, a large bank of test questions, on-campus orientation sessions, on-campus testing sessions, on-campus videotape viewing for those enrollees unable to watch during open broadcast, a telephone hot-line, a newsletter three or four times per semester, a manual for instructors of telecourses in general, development of promotional materials and integrated reading lists and a miscellany of large and small details requisite to an adequate campus support system for such carefully designed broadcast activity.

A new telecourse production decision is made only after extensive investigation of the "marketplace" reveals that a course of estimated comparable quality to fulfill a current need does not exist. Cost analyses are made. Past experience has shown that course production can begin at $300,000 and rise from there. Excellent quality productions, however, can recoup these expenses and become income-generating from widespread leased circulation. Other institutions may be invited to participate on a coequal basis.

After the decision is made to produce a given course, the several participating institutions will appoint representatives to serve on a faculty advisory committee. From that committee will come a faculty writer for the course, whose parent institution agrees to provide adequate release time for course preparation.

A course blueprint is evolved, and the faculty committee develops course content, resources outside the faculty group and required support materials and structures to be provided on the various participating campuses. An instructional design specialist joins the group, to be followed shortly by a television producer. The faculty writer begins work on the content manual for each of the lessons, the producer decides what they wish to treat in each visual program and others decide what to treat only through the manuals or through other channels of communication.

At this point, the producer and the faculty writer work closely with a professional script writer. While the faculty member determines the academic content, the producer makes decisions regarding the visual content to be seen on the television screen.

The entire production culminates in the scripts going before television (or film) cameras in a professional studio setting.

The single driving quality which makes the Dallas and Tarrant County system work is cooperation. It should be emphatically noted that this broad-based cooperation is found openly at the junior or community college level, seldom at the senior level.

TAGER: For the Company that Doesn't Operate its Own University. In almost complete contradistinction to the production and later-broadcast orientation of the technique outlined above, the TAGER operation and approach to instructional activity centers on a live, on-camera instructor at almost all times.

TAGER was formed over a decade ago to allow various universities and colleges in the region to share their individual resources and to serve the needs of industry and science in the rapidly expanding Dallas-Fort Worth area.

The TAGER technical system consists of a major signal switching center at TAGER headquarters on the edge of The University of Texas at Dallas campus. The network joins 10 college and university campuses, 14 private industrial receiving sites, the Regional Instructional Television Consortium of 12 independent school districts and administrative centers and private schools and the several hospital members of the Dallas Area Hospital Television System.

> It is a closed-circuit system: courses carried over the network can be received only by other TAGER institutions or by the specially equipped receiving classrooms scattered throughout business, industry, and neighborhood schools in the Dallas-Fort Worth Metroplex. The TAGER Television Network is also "interactive"--that is to say, students who are remote from a professor teaching a course on his own campus are provided talkback telephones which enable them to ask questions or discuss a lecture point with the professor; and this discussion is heard throughout the network wherever other students in that course may be located.[5]

Each TAGER member institution has at least one television-equipped classroom studio where certain courses are taught to students on that campus. From this special location, the signal is sent to the TAGER switching center, and from there relayed to the various receiving classrooms throughout the area.

Gilbert Peters, president of the TAGER network, describes a financial benefit accruing from network membership:

> When related to a cost/benefit analysis, there are examples of profitability to members right now. Because we have been able to take already existing instruction, and by adding a small increment of cost, been able to take that instruction and deliver it to aggregated users. The dollar profitability of the network is in the way it provides access to large numbers of people.[6]

Contemporary Channels of Educational Media in Texas

Just as we once believed our energy supplies to be inexhaustible, we believed there to be unlimited space "on the air." Such is not the case. The heavy load of message traffic created worldwide through electronic communication is overloading conventional broadcast channels.

It is in this context that we find technology exploring further into the possibilities of signal transmission through systems other than open broadcast.

A Definition of Terms: "Narrowcasting." It will be helpful to define a special term which has come into wide use among communication practitioners. "Broadcasting" has been used for decades to denote that kind of electronic signal transmission intended for the general public. On the other hand, "narrowcasting" has evolved as a definition of that area of transmission interest in which only a special part of the public is served, a sector whose needs are answered by specially

directed messages. It involves an equipment array in cost and sophistication somewhat beyond that of the ordinary viewer/listener.

As the electromagnetic spectrum moves toward capacity, the use of narrowcasting has become increasingly prevalent. Due to its innate conservation of spectrum space and its ability to be targeted directly toward an extremely small segment of the general audience, narrowcasting will be the future primary concern of educational technologists.

At the present time, narrowcasting is demonstrated in several different applications:

1. Microwave Transmission. Microwave transmission uses a dish antenna for both signal transmission and reception. The result is a signal path, virtually pencil thin, with little radiation spillage to either side--a highly concentrated and efficient use of transmission energy which denies to other users very little spectrum space and geographic interference. The equipment, however, is relatively expensive, costing from $3,000 to $15,000 for reception gear.

2. Instructional Television Fixed Service. A form of narrowcasting specially reserved for educational uses is the so-called 2500-megahertz Instructional Television Fixed Service now in use in many parts of the country. Although useful for short-range transmission only, the radiation is omnidirectional, with one transmission center permitted to operate on four different programming frequencies at the same time. The end user must equip himself with a down-converter and associated equipment in order to receive the signals. As in point-to-point microwave, a dish antenna is required to gather adequate energy from the transmission to produce a video picture. Here again, due to the ITFS signal characteristics and its placement in the Super High Frequency range of the spectrum, there is little threat to other spectrum users, thus conserving the available spectrum frequencies.

3. Videocassette. Within the last decade we have been presented with a full range of video recording and playback equipment to fulfill both broad and specialized uses in the home market and within education and research. There are three principal videocassette formats in use worldwide: the original Sony three-quarter-inch U-Matic, the Sony one-half-inch Beta and the one-half-inch VHS format. At this time, it appears that these three formats are well entrenched and each will be widely used until some new forces enter the field to rearrange the relative positions of each in the marketplace.

4. Videodisk. And that new force could very well be the videodisk. Although the new device can now be considered as "here," it has yet to be released fully and promoted in the marketplace. We are promised superb picture delivery in full color at extremely low prices per disk, playable on machines which will cost about $400 and connect directly into presently-owned television receivers. In comparing videodisk capability to videocassettes, one must bear in mind that videodisks can be manufactured only in lots large enough to make the complex process economically feasible. On the other hand, videocassettes lend themselves to ease of individual (personal) use in recording and duplicating, recording on location and a ready adaptability to the varying needs of users.

5. Cable Television. The principal advantage of cable television rests in its method of program delivery by a single wire or cable with maximum preservation of the open spectrum. There is virtually no radiation in the system. Large numbers of individual program signals can be transmitted on the same cable with complete separation of individual program signals at the user end. Program initiation into the cable system can occur by any of several systems--live camera, videotape, microwave, ITFS, land-line network or communication satellite. A financial benefit is enjoyed in that one inexpensive "drop" at one location can deliver a signal which can then be processed and boosted for further multiple distribution within a building or other complex receiving site.

In many communities, educationally-minded citizens and community leaders are extracting from potential cable franchises--or are having written into requests for proposals--the stipulation that a certain number of newly expanded available channels be consigned solely for educational uses in the community.

It is within the context of these new franchise stipulations that the forces of education can look forward to an authentic breakthrough in the distribution of educational products. The TAGER system and the open-channel broadcasts by the community college districts are restricted by distribution limitations and high equipment costs. Those restrictions fade away in the presence of cable television capability.

It will no longer be necessary for a user--no matter what his personal or corporate wealth--to invest thousands of dollars in microwave reception gear. Simply for the cost of installation of a cable television "drop," the full complement of video signals, including those reserved for educational uses, becomes instantly available through any television set connected to the in-house distribution system and without the addition of expensive signal conversion equipment. Even with the occasional necessity for some kinds of privileged or private distribution arrangements--such as hospital grand rounds and other matters not suited to general public consumption--signal scramblers and decoders are available at relatively low cost, making such programming easily available to potential users.

Thus we can look forward in the immediate future to a capability to distribute educational products far more widely than ever before, even in the face of increasing energy costs, educational planning and institutional overhead. This capability presages new services for the in-home viewer/consumer which, heretofore, were beyond consideration because of expensive equipment required. In most cases, this new service capability will cost only a few dollars each month, depending upon the specific service purchased.

We do expect that entertainment programming will continue to form the backbone of financial support for these added services. Fortunately, however, forward-thinking individuals have learned quickly that other services not so dependent upon the entertainment component can be made available if planned for well in advance.

6. Communication Satellites: Public and Private. Communication through the broadcast signal long has been restricted by signal degradation through space and across varying types of weather and terrain. We have already discussed several techniques which circumvent this problem through non-broadcast techniques. Furthermore, widespread distribution of signals also has long suffered from restrictions of coverage due to limited land-line availability caused by budget constraints and increased signal degradation over exceptionally long-line transmission routes. Communication satellites offer immediate solution to many of these problems. When one puts aside the complex technology required to place a satellite in orbit,

these devices become easy to understand. They are simply relay stations for electronic signals placed in orbits which are high enough to allow direct line-of-sight transmission paths from a large portion of the hemisphere below.

The meaning of this new technology leads inevitably toward the broader dissemination of media products, coupled with the increased cable systems of the immediate future. And, inevitably, there will come a time when the cable systems will be supplanted by direct satellite-to-home reception systems.

The speed-up in technology must be matched by a concomitant speed-up in our efforts to incorporate these techniques into our instructional strategies and services. Preparation should already be underway if we are to facilitate these opportunities in a coordinated statewide manner.

Some Technology to Watch Closely. We would conclude this assessment of projected impact of media on higher education by calling attention to some areas of technological application which bear close observation through the coming years. Each is electronically based, each employs some form of visual media and each, if properly managed, can be structured into tools of immense educational value.

a. Computer-Assisted Instruction. Usually referred to as CAI, computer-assisted instruction always has been regarded as one of those kinds of developments in education which would eventually revolutionize instructional practices at all levels. After some two decades of development and use, however, it has yet to make significant inroads into the broad educational marketplace. Results of our investigation generally show that CAI presently is regarded as a supplemental resource, well-suited to persons who are self-starters and highly disciplined. But as a central tool for programs of extended educational development, our responses indicate that they are considered of peripheral interest except in those areas there the use of computer technology is heavily entrenched already. We have found, though, that interest exists in the future possibilities for developing CAI-type strategies which incorporate videodisk technology.

b. Microprocessors. Simply defined, microprocessors are tiny electronic components which can read data from inputs, perform computations and control outputs. Among their special properties is their capacity to be programmed. Various functions can then be performed in any sequence desired. One example will be the combining of microprocessor technology with the videodisk. We then will be using computer-based random-access visual-learning tools which can combine, in a highly dynamic and dramatic form, both print media information and that derived from visual and aural media. Packaging these systems will form entirely new disciplines in the future years of curriculum design.

c. Holography. The practical uses of the holographic image will, one day, be available to us. The ability to transmit an electronic image in three dimensions and to perceive it in such a way that it can be observed from many angles is to present to us a tool of incomprehensible value to education. In addition to its astounding value as a tool of visual communication, holography also points the way to new frontiers in data storage in sequential layers of information, within the structures of the hologram.

We do not propose to have presented an exhaustive list of all possibilities of the technology. But we are assured that if even these we have described were to be incorporated maximally into a coordinated statewide system of technology and media development, higher education in Texas would have entered a new dimension of streamlined and efficient service to the always-segmenting publics which need its services.

Impact of Media on Texas Higher Education

There are uncertain financial times ahead for all institutions of higher education, and as far back as the early '60s electronics was seen as the solution to this problem. Circumstances are optimal for policy-makers and opinion leaders in higher education to take advantage of revolutionary tools which will both fulfill the mandate for public accountability and provide a better educational product for the public which pays most of the bill.

The Sharing of Faculty Resources. Though only one among many, the TAGER experience in North Texas has shown with little argument that the faculty resources of one institution can and should be shared with sister institutions through electronic media. The development of telecourses--such as those mutually developed between Dallas County Community College and Tarrant County Junior College, along with other institutions elsewhere in the country--has provided us with the living example of a richer educational experience through the sharing of resources of teaching and planning.

We believe that a course planned by several credentialed instructors in a given discipline stands to be, generally, a richer learning experience than that planned by only one such authority. We know now that one college or university effectively can offer specialized courses to other institutions in its geographic area which, for one reason or another, cannot spare the money or facilities to develop that specific course area itself. Problems of administration and award of credit can be minimized--if there is a willingness to develop the required administrative channels. The entire structure of higher education is enriched by the process.

The Sharing of Facilities. We already are aware that the emphasis through the next decade will be brains and not bricks in the further development of higher education in Texas. It seems clear that one way to meet the trend is through the intelligent and widespread application of electronic media techniques.

It now is possible to develop networks and interconnections of campuses, institutions, agencies and any other required installation in any combination of facilities deemed necessary. Talk-back equipment is readily available. With these installations could come an incomparably efficient new approach to building utilization across the state.

Not only do these new possibilities open up fresh approaches to facilities management, they also provide public funding agencies a new level of accountability toward the stewardship of public funds. Access to equipment and capital-intensive instructional environments can be shared among many institutions in reduced periods of use if innovative electronic techniques are harnessed to fulfill the physical requirements of similar instructional requirements.

The time-sharing of computer facilities already is an advanced technique. The broader implementation of communication satellite links between computer facilities--

even at the international level--points us toward the inevitable need for sharing of other facilities at less-sophisticated levels of technical development. The implications of expanded research activity among and between university components, and among large independent academic groups, is incalculable. Again, the future linkages possible through communication satellites, which are of proven efficacy, continue to open up revolutionary application of electronic technology and more efficient use of computer hard- and software.

Libraries: The Elusive Dream. It has been a goal, now decades old, to develop an interconnected system of library resources throughout the nation, the product of which would be a system of maximized cross-referenced resources and interlibrary lending. At the present time, there exist two major bibliographic data bases. All libraries in the country, properly equipped with computer terminal equipment, can access those data bases through regional "brokers." It is expected that these current arrangements will be reshaped into more fitting forms and services as the decade proceeds.

Cataloging the printed word, collections of which continue to mount geometrically, will require increasing amounts of automation through the coming years. The library community, already fraught with economic obstacles, looks ahead with some concern toward its ability to keep up with the pace without steadily increasing its data processing ability.

Furthermore, there now are unnumbered mountains of aged volumes, originally cataloged many years ago, which are falling apart on the shelves. The libraries are faced with the difficult task of preserving these volumes before they completely disintegrate--or, to develop some other system which will protect the value of these collections. They are looking toward the development of new technology, much of it electronically based, to rescue massive collections from the onslaught of time and chemical change within the paper.

The ultimate goal of libraries, of course, is to have all catalogs of all libraries available electronically to all libraries everywhere at any time--with hard copy print-out available upon call-up. Here again, the technology to do this is here. And the planning for this eventuality should be an input into any far-reaching communication development plan.

Catalog Exchange and Cross-Development. Our investigation confirms that there is no area of greater potential benefit to higher education through application of media techniques than in the sharing of curriculum catalogs among institutions. Here again, we find the technology in place. We would point again to the North Texas examples. A specific example is that of one university whose reputation for work in the classics was well known. Another university in the TAGER system desired that particular catalog resource for its students but was unable to finance locally the start-up of a new disciplinary interest. Through TAGER, arrangements were made to offer the course on the network. The program of one university was enriched vastly, providing its student clientele with an experience and resource otherwise unavailable except through complicated weekly procedures of cross-town travel and expense. That combination of obstacles likely would have discouraged many students from the endeavor.

We also are reminded that the earlier exercises in multiple-institutional development of telecourses--together with the richness of all supporting materials--illustrates this implication as well as any. We are receiving signals on all sides that the long era of institutional independence has passed; that even components of

the same administrative system, each of which has clung to a past tradition of insular development, a tending to its own affairs, will be forced to rethink positions and policies.

The presence of electronic technology not only will furnish dynamic possible solutions to many dilemmas, but also will open up vast new arenas for the development of new instructional strategies--all toward the fulfillment of needs of new educational publics. We look forward to new opportunities for cross-development which can be made to provide for academic professionals expansive new grounds for career development.

The Application of Technology

The use of technology in delivering the educational product is accelerating, and its disciplinary coverage is widening. We see the task of implementation clearly divided into (1) an administrative and teaching area and (2) an operational area.

Administrative and Teaching Area. It will be possible for all colleges and universities everywhere, not just in Texas, to receive electronically direct instructional and other reinforcement visual and aural materials of very high quality 24 hours a day. Delivery systems can be varied: direct point-to-point microwave, communication satellite delivery systems received directly on individual campuses, videocassette or videodisk circulation dependent upon library or other circulation systems using mail or courier services. In our judgment the potential quality of the delivery systems will far exceed the available software to be programmed through these systems.

That shortage, however, can decline steadily if more institutions through the country decide to enter the software production business in an effort to recover some of the capital investment needed for providing these kinds of distribution in their own service areas.

In order to assess the need for these resources within the intricate fabric of Texas' higher education structure, establishment of a statewide clearinghouse is needed. This clearinghouse is vital to disperse efficiently required funds for construction, maintenance, planning, research and administration of the complex transmission, production and non-electronic delivery systems which will be possible.

Through computer cataloging techniques, this coordinating body would establish an on-line system of cross-reference location of materials and resources which are available within Texas and from other institutions outside the state. All institutions would have terminal access to this catalog.

A full-time staff within the structure of the Coordinating Board--or a Texas Commission on Educational Communications--would study and make recommendations concerning the needs of all institutions, public and private, at all levels, academic and professional.

This body also would move forward in reordering academic reward systems, not only in Texas but within the instructional media community at the national level. Many new and younger faculty of the decade will be anxious to devote time and effort to these projects if they are given adequate reward in ways comparable to that given the publishing requirement at the present.

There would be installed a statewide library of coursework and reinforcement materials of an audio, video and print nature available on call to colleges and universities. The extent of the shelved collection would depend upon the sophistication of the state's existing signal distribution system. Even with multiple programming channels available, some locations will be isolated geographically from electronic pathways, thus requiring the use of videocassettes or videodisks delivered through mail or courier.

In most locations we would see the possibility of feeding programming from several switching centers to almost all locations on-line, many to be recorded at the distant location for later use. These activities would be monitored closely in order to comply with copyright regulations and residual financial agreements with program owners and producers. There would be a running inventory of cable facilities and their use by local educational institutions in the state and a constant assessment of how best to utilize the distribution channels available.

While the coordinating body would provide continuing service for the young student preparing for life work, it would give increased attention to older students, whose numbers are expected to increase in the 1980s. Educational need for this older population and for those who need specific learning in line with certain job requirements can be realized throughout the state with satellite and cable distribution systems, potentially transmitted directly to meeting places or to private residences.

Just as important as a revamping of the faculty reward system is a reassessment of the funding formulas in relation to the new enrollment characteristics and an outdated need for teachers to be in direct visual contact with the students seated in the classroom. With reworked funding formulas, the development of new media-oriented materials can become an attractive activity without sacrificing valuable dollars based upon the older formula philosophies.

The coordinating body would consult directly various institutional administrations in a continuing effort to promote the cross-development and cross-cataloging cooperation needed while promoting regional and statewide workshops in the development of system-usable media units. It also would promote regional and statewide workshops in the development and use of educational media and technology.

It is probable that, by the end of the decade, the state of Texas, as a business body, will be using communication satellite links to conduct state business, much as the Tex-An system is used today. This new activity will incorporate local receiving equipment at most locations throughout the state where agencies exist, in addition to all public universities, colleges, agricultural experiment stations, etc.

The satellite system, when combined with local cable distribution possibilities, will place virtually every location in Texas--from the most remote to the most populous downtown metropolitan area--within immediate access to electronic communication signals, either for direct use at the time or for recording and later use. The scheduling of activities of such complexity and magnitude will require computer planning and automated operation. A by-product of this computer control will be an interactive potential between certain equipped locations in the state. Through this system possibility, statewide live teaching with student feedback, visual and aural, will be possible.

The satellite system further will allow a widening of library resources which has been impossible up to the present. With channels reserved for dedicated in-state library use, all library facilities so equipped with land-line or up-link satellite access will have entrance into the state, regional and national data bases which are now in various stages of formation. This system will allow a search of all bibliographic resources throughout the nation while, depending upon local equipment, providing hard copy print-out and transfer of printed documents and circumventing the older techniques of sending printed materials through the mail with resultant handling damage.

Finally, this coordinating body will be responsible for conducting, throughout the state, short courses and other activities to instruct college and university personnel, both teaching and administrative, in the implementation of the many facets of the system. Where conditions permit, the development and production of specific teaching materials--full-scale productions and modular segments of small and large teaching packages--will be encouraged.

This step in the process will be central toward implementing the college/university teacher's role as a manager of information resources. Through publications, newsletters, local meetings and in-service programming throughout the state, all institutions will be encouraged to participate actively in the full range of system services.

Operational Area. Facilities sharing is the raison d'être for the system envisioned here. In the operational area of this possible system, there are three principal requirements: (1) a continuing technical requirement of the highest engineering quality, (2) the production or acquiring of software to fill momentary and future requirements and (3) maximized and efficient use of the system throughout the state.

The continuing technical requirement will subsume all distribution techniques: maintenance of the on-line real-time transmission system, both land-line microwave and/or communication satellite up- and down-links; maximum quality of delivered signals at the consumer end; supervision of production quality in studio and remote location as all engineering and technical aspects; high-quality duplication of materials which are delivered through recorded techniques; and a continuing advisory service in new equipment and technology coming into the marketplace.

The highest technical standards will be established in overall facilities-sharing channels which will require real-time, on-line transmission resources through microwave, communication satellite and local telephone and land-line transmission paths for interconnection of computer installations, data transmission, state agency communication and live interconnection among campuses and between campuses and business/industrial/professional locations.

Close working arrangements will be developed with the state's major educational/instructional production facilities already extant in scattered locations.

There will be required an engineering consultation arrangement within the interdisciplinary research and coordination structures which will evolve. Consultants will advise non-technical persons on the limits of the technical system in terms of technology available and financial parameters of proposed applications of the system.

Conclusion

Thus we see ahead a time of colossal possibility for education--a time comparable to none in our recent or distant past. The opportunities now afforded us for the preparation of better educational experiences for an enlarging public of segmenting need have never before existed in the history of man's educational development.

We would reemphasize that the movement in these directions already is well underway. Furthermore, the state of Texas is woefully behind the times in many areas of this activity. Elsewhere in the country, where the varying local conditions have been favorable, electronic networks have been in operation for many years. Their software products already are becoming available in the nationwide marketplace.

Delivery systems to distribute this material are now in place. And we are only a short time away from that moment when a small institution in far West Texas need only purchase a small dish antenna, connect its amplified output to an in-house television distribution system and welcome into its curriculum the instructional product of some institution on the East or West Coast. Thus, the work of major colleges and universities hundreds and thousands of miles away will take over where we in Texas have been unable to provide the service to our own.

Placing all administrative problems aside, the inescapable fact remains that the software and its relatively inexpensive distribution and availability is on the way.

NOTES

[1]Interview with Bonner McLane, executive director, Texas Association of Broadcasters, Austin, Texas, Sept. 4, 1980.

[2]Interview by telephone with John W. Mankin, Jr., executive director, Cable TV Association of Texas, Tyler, Texas, Sept. 5, 1980.

[3]Richard B. Hull. "A Note on the History Behind ETV," Educational Television: The Next Ten Years, Stanford University, The Institute for Communication Research, 1962, p. 335.

[4]Dallas County Community College District, ITV Close-Up: The First Six Years, May, 1978, p. 3.

[5]The Association for Graduate Education and Research, Bulletin of Graduate and Undergraduate Courses, Spring 1978, p. 1.

[6]Interview with Gilbert Peters, president, The Association for Graduate Education and Research, Inc., Richardson, Texas, July 17, 1980.

[7]The Austin American-Statesman, Sept. 10, 1980, p. A13.

FACULTY TENURE IN THE 1980s: PROBLEMS AND OPPORTUNITIES

by William R. Keast

The decade of the 1980s promises to be marked by a continuation of trends affecting higher education which began to emerge in the late 1960s and which have characterized the 1970s. The rate of growth in student enrollment will continue to slow, approaching a steady state in many institutions. In some institutions enrollment will continue to decline, and there will be more closings and mergers, especially in the private sector. (The National Institute of Independent Colleges and Universities recently reported that 207 independent institutions vanished during the 1970s. On the other hand, 76 new independent institutions were opened.)

For public institutions in Texas, enrollment prospects, though mixed, are on the whole more favorable than those in parts of the country like the Northeast, where substantial out-migration exacerbates the effect of slowed birth-rates in the 1950s and '60s. The Coordinating Board's most recent enrollment projections for all Texas institutions of higher education in the 1980s forecast a total growth of just over seven percent (an increased enrollment of 46,800 students). The public junior colleges are expected to grow most--with increased enrollment of 9.2 percent--continuing a trend observable during the last decade. Public senior institutions are expected to enroll 21,000 more students, an increase of 6.25 percent over 1980 levels. On the other hand, the independent senior colleges and universities will have nearly stable enrollments, growing by only two percent, and the independent junior colleges will decline by nearly 10 percent during the decade.

Among the 37 senior public colleges and universities in Texas, enrollment prospects are highly variable, and the consequences for institutional planning may be expected to differ sharply from one institution to another. While total enrollment in this sector of higher education will grow by 6.25 percent, nine of the 37 institutions will sustain decreases in enrollment below 1980 levels, the declines ranging from six to 16 percent. Of the 28 institutions whose enrollments will be stable or which are expected to grow, the growth in several will be significant, over 10 percent in four institutions.

Enrollment projections--no matter how accurate they may turn out to be--do not enable us to gauge the probable impact of changing enrollments, whether decline, stability or increase, upon the institutions. Such projections necessarily omit the targeted enrollments used in earlier years as the basis for campus construction, recruitment of faculty, program development, and the like--in short the entire range of plans, expectations and commitments that have characterized the institution during the last decade or two. Obviously an institution built and organized to achieve an enrollment of 5,000 by 1984 which finds itself in 1980 with an enrollment of 3,000 and a projected decline to 2,500 by 1990, is in a very different situation indeed from that of a sister institution whose enrollment target was also 5,000 by 1985 but which now finds that it will attain that size more slowly than originally planned, say by 1990 rather than 1985. The conclusion to be drawn from such examples as this is that no single prescription for the management of faculty staffing problems during the 1980s will fit all

institutions equally, no suggestions will be equally applicable to all. In the absence of detailed analysis of the situation of individual institutions, which is beyond the scope of this paper, it must be left to administrators, faculty and boards of control to develop patterns of response adapted to the unique problems of each institution.

A slowing of the rate of growth in enrollment in higher education--amounting in some cases to actual decline--is only the most obvious of the trends of the 1970s that we may expect to see continue in the 1980s. A second trend, with which most institutions have had to grapple recently and which has already caused great difficulty, is the shift in enrollment among disciplines and departments in most institutions. Very substantial increases have already occurred in business, communications, computer science, vocational programs and journalism. Pre-professional programs--pre-law, pre-medicine, etc.--have burgeoned. At the same time, the number of students majoring in subjects that were very popular in the 1950s and 1960s, such as English and foreign languages, has declined sharply; in some institutions such departments now find themselves fulfilling largely a service role, providing elective courses for students whose major concentrations are elsewhere. Whether the increased vocationalization that has been so prominent a feature of higher education in the 1970s will continue or whether it has reached its peak and will now level off remains to be seen; no confident predictions can be made. But most institutions probably would be wise to build into their planning the assumption that the end is not yet in sight.

Other trends that have emerged strongly in the 1970s and that will probably continue in the 1980s may be touched upon more briefly. Curtailment of some programs will no doubt continue, either because of continuing shifts in student interests or because--as in graduate programs in some areas --employment prospects are too meager to justify continuing at earlier rates. While some programs will be curtailed, other existing programs will have to be expanded to meet student demand. And surely new programs will be initiated. This is potentially, of course, the great area for new faculty and administration initiatives in the 1980s and beyond. The unmet educational needs of the United States are enormous. Though the 18-to 21-year-old segment of the population will decline until 1991, it remains true that too small a proportion of this segment goes on to some form of higher education; the college-going rate is much lower for the poor and members of minority groups than for the white middle class; and in some states college attendance is only half that in others.

Much of the enrollment growth during the last few years has been among older persons. Since the population over age 22 numbers 133 million, about eight times as many as the 18-to 21-year-old group, it is easy to see that even modest increases in the enrollment of older persons could offset the expected declines in the traditional college-going population. We will surely see more programs in continuing education, in professional refresher education, in retraining for new careers, in such leisure-time activities as the successful Elderhostel program, in evening and weekend courses for career advancement or personal enrichment. The opportunities are virtually unlimited.

No doubt we will continue to see in the 1980s the sharp increase in interest in the quality of teaching--especially of undergraduate teaching--that began in the 1960s and characterized the 1970s. We will continue to see a demand for a larger representation of women and members of minority groups in college and university faculties, especially at the senior levels, and in responsible administrative posts. Institutional planning will have to include this as a primary goal, and graduate faculties will have to intensify their efforts to prepare larger numbers of women and members of minority groups for faculty and administrative roles.

An imbalance between the number of persons trained for and seeking academic posts and the number of posts available has plagued many disciplines for several years. Deliberate cut-backs in graduate school enrollments have eased the situation somewhat, though not before many young people suffered grave disappointment. We already have begun to see the beginnings of alternate career planning--programs designed to provide, for persons who have poured advanced studies in fields for which the market has dried up, training which will enable them to find positions in other fields, so that the holder of a doctorate in art history or Germanic philology, for example, might shift to a position in business or communications. Probably such programs will grow. And they might well suggest ways to extend and improve career planning for faculty, which will be discussed below.

The institutions of higher education which will have to cope with the problems of the 1980s have inherited from the 1960s and 1970s some characteristics which make their situation more difficult and which will test their resourcefulness in the years ahead. Typically, they have a relatively high proportion of faculty holding tenure appointments. The proportion of tenured faculty in Texas public institutions is less than in the country as a whole, but the proportion is high enough, given enrollment projections for the next decade, to cause concern. Faculties are relatively young and retirements will typically not occur at steady rates for a decade or more. In many disciplines, faculties were assembled to meet student interests and deal with student numbers that have changed significantly during the last decade. Physical plant, administrative organization and support facilities in some cases were designed for a larger student population than may ever enroll. Faculties have often been recruited with commitments, expressed or implied, about advanced or graduate teaching, promotion and tenure status that have become difficult or impossible to fulfill. In the past, especially in the late '60s and early '70s, promotions and tenure in many institutions were awarded early and liberally; the habits of those days linger, and faculty and administration experience difficulty in developing new habits of selection and promotion more appropriate to leaner times. Most institutions have unfulfilled commitments to the appointment and retention of more women and members of minority groups. All institutions have had to cope with budgetary constraints and inflationary pressures more or less severe during recent years; most now find themselves--especially with respect to faculty salaries --funded at levels below what high quality performance requires. In short, the emergent problems of the 1980s will have to be dealt with by institutions that are in difficulty even now.

Faculty Tenure: Should It Be Retained?

A basic question is, what sort of faculty appointment system will best

enable Texas colleges and universities to fulfill their mission of providing high quality education not only in the 1980s but in the decades beyond? Most Texas institutions employ some version of the system of faculty tenure which is nearly universal in higher education in the United States. Under this system, a faculty appointee beginning an academic career, after having achieved the requisite professional training, serves a probationary period of up to seven years while his or her qualifications for future service in the institution are assessed. If the faculty member is judged by his professional colleagues and officers of administration to possess the abilities in teaching, research and service that the institution needs for the future, he may be granted tenure--a continuing appointment until retirement (not for life, as is sometimes said). If he or she is judged not to have these qualities, the probationary faculty member leaves the institution. A tenure appointment may be terminated before retirement for cause (such as demonstrated incompetence or substantial neglect of duty), for medical reasons, because of the termination of an academic program (such as the decision to close a school or department) or because of financial exigency which threatens institutional survival. In all such cases of dismissal or termination of a tenured faculty member, standards and due process procedures have been developed and are widely observed to insure fairness both to faculty and institution.

Arguments favoring the abolition of the tenure system have often been made in the past. They are being made again. What is usually proposed the replacement of tenure with some sort of contract system. Under such a system (various forms exist both in Texas and elsewhere, though institutions using this form of appointment employ only about five percent of all faculty in the United States), a faculty member receives a contract for a period of time; his or her performance is evaluated during the contract period; if the performance is found satisfactory, another contract may be offered; if not, the faculty member leaves the institution. The contract system is like the probationary phase in a tenure system, but continued indefinitely.

Those who advocate the abolition of faculty tenure and the adoption of some form of contract system for faculty employment argue that a contract system would offer significant advantages to institutions in times of stress such as we face in the 1980s. The tenure system, it is said, with its long-term commitments to faculty, makes for institutional rigidity: with a large proportion of faculty on tenure, and with many of the tenured faculty relatively young, retirements do not occur often enough to permit the recruitment of enough young, new faculty to enliven the institution, especially larger numbers of women and members of minority groups. The tenured faculty are the highest paid and constitute the heaviest claim on the salary budget; if they could be replaced by younger faculty on lower salaries for shorter contract terms, budget strains would be eased. Tenure, it is argued, produces a protected mediocrity, "deadwood," faculty who go on doing the same old thing year after year, with diminishing interest in teaching and with no desire for innovation. A contract system, it is said, would enhance institutional flexibility, conduce to needed innovation, eliminate faculty "deadwood," improve the quality of teaching, and save money.

No one familiar with higher education in the United States would deny that there is some truth in these criticisms of academic tenure. Just how much truth is another question. The only comprehensive attempt to answer the question is contained in the report of the Commission on Academic Tenure in Higher Education, sponsored by the Association of American Colleges and the American Association of University Professors and supported by a grant from the Ford Foundation. The present writer served as chairman of the Commission. In its report, Faculty Tenure (1973), which examined tenure and contract systems across the country and assessed the arguments for and against tenure that had been put forward (they were essentially the same as those now being heard), the Commission concluded:

> The commission affirms its conviction that academic tenure, rightly understood and properly administered, provides the most reliable means of assuring faculty quality and educational excellence, as well as the best guarantee of academic freedom. (Faculty Tenure, p. 21)

Among the disadvantages of contract systems are the following: judgments of professional competence are made by peers who are themselves on temporary contract, with the grave risk that reciprocal favoritism or the desire to diminish future competition for reappointment will prejudice the assessment. Or judgments will increasingly be made not by professional colleagues but by administrative officers, who cannot be expected to have the professional competence for sound judgment in all the fields cultivated in a college or university. Prolonged exposure to the uncertainties of contract renewal will surely have damaging effects on faculty morale and performance, will force faculty members to spend much of their time and energy looking outside the institution to insure another post in case of non-reappointment and will surely lead to some form of civil service or collective bargaining arrangement to protect job security, as it has elsewhere in our society. The time-tested protections of academic freedom which tenure has been found to provide would be abandoned in favor of regular resort to the courts; expense, delay and uncertainty would result, and increased surrender of institutional autonomy.

Surveys conducted by the American Council on Education have revealed that institutions using contract systems are in fact far less selective than those using tenure systems. In 1971 more than nine out of 10 contracts were renewed in 87 percent of institutions using contract systems; in two-thirds of the four-year institutions, all contracts were renewed; fewer than five percent of contract institutions renewed less than 80 percent of expiring contracts. By 1974 it was clear that contract institutions were becoming even less selective: no institution renewed less than 80 percent of expiring contracts; 93 percent renewed 90 percent or more; 50 percent renewed all. By contrast, in 1974, among tenure-granting institutions, only 37 percent conferred tenure on all those considered for tenure that year--down from 42 percent in 1972; 23 percent granted tenure to 60 percent or fewer of those considered.

These contrasts are not surprising. A tenure system requires that a decision be made by the end of the probationary period; it forces a definitive

judgment. In contract systems, judgment can always be temporary; no final decision ever need be made; contracts can always be renewed. Overwhelmingly, they are. Contract arrangements, the available evidence suggests, imply a system of virtual tenure, far less selective than a true tenure system, without the protection of academic freedom that tenure has been found to provide.

Contract systems are in effect in enough institutions, including several in Texas, to permit a careful, objective assessment of their operation and of the extent to which they can be shown to have the educational advantages that have been claimed for them. To my knowledge, no such assessment has ever been made. Until it is, and until its conclusions have been submitted to evaluation, it would be irresponsible to propose the abolition of faculty tenure and its replacement by contract appointments.

Apart from all this, abolition of faculty tenure in Texas institutions would do them grave damage in recruiting high quality faculty, even in a depressed market. Texas colleges and universities compete for faculty in a national market. Tenure arrangements are in effect in 95 percent of the institutions in that market, whether as suppliers of graduate and professional training or as recruiters of faculty. To abolish tenure would be to withdraw from that market, because the most highly qualified young faculty, who always have choices, will prefer to place themselves in a mainstream institution and to compete under national norms and traditions for a tenure position. No doubt at a time of severe distress in the academic marketplace, an institution that abolishes tenure will be able to fill its contract slots. People want jobs, even temporary ones. But such an institution will no longer have access to the national pool of the best candidates. And if it appoints those who are unable or unwilling to compete in the national market, and then reappoints 90 to 100 percent of them when their contracts expire--as contract institutions regularly do--it will surely have given up hope of achieving educational quality in the years ahead.

If faculty tenure were indeed a major cause of institutional weakness, as those who advocate its abolition claim, we should expect that those institutions with the strongest tenure systems would be the poorest in educational quality, would be the least innovative, would be in the gravest financial difficulty, and would have the least influence as models in higher education. But in fact the opposite is the case. Tenure is most secure; the strongest tenure arrangements exist; and tenure is most highly prized in the most prestigious institutions in the country--in the institutions recognized by all as colleges and universities of the first class. It is not necessary to name them here. And it is in these institutions that faculties and administrators have worked most zealously together to scrutinize their tenure arrangements in order to improve them.

Toward Improvement of Tenure Policies and Practices

The report of the Commission on Academic Tenure in Higher Education was largely devoted to a set of recommendations--47 in all--through which the Commission believed institutions could make their tenure arrangements work more effectively. Other recommendations have appeared elsewhere in the literature in recent years. It is not necessary in this report to attempt an exhaustive compilation of these. It is more to the point to concentrate

on a number of topics that seem most critical for the decade of the 1980s.

We can begin with an observation that should seem self-evident but that is, alas, not embodied in the habits and procedures of most institutions: in the formulation and application of faculty personnel policies, nothing sound can be done unless faculty, administration and boards of control work closely together, with full and open communication, with mutual recognition of responsibilities, and with a genuine joint commitment to the attainment of the institution's objectives. Never is this precept more urgent than when circumstances seem to make it most difficult to practice.

1. Staffing Plans Every institution should have a staffing plan which is based on the present age and rank composition of its faculty and which furnishes a guide to recruitment, reappointment and award of tenure in the light of enrollment projections and trends, budget prospects, program changes, anticipated retirements and other factors, all related to the institution's mission. Few institutions have staffing plans of sufficient sophistication to enable them to control their personnel actions in difficult times. The plan should be developed by joint faculty-administrative consultations. It should project five to 10 years into the future. New information should be incorporated into the plan on an annual basis and the plan should be kept under review and revised regularly. Probably a standing committee of faculty and administration should be organized, meeting regularly, with access to all relevant information, with the responsibility for developing the plan in the first instance and submitting it to the institutional board of control for approval, of monitoring the plan and proposing such revisions as seem necessary and of insuring that all components of the institution are informed and that information from them flows to the planning group on a regular and uniform basis.

   Staff planning must be on a departmental, divisional, school, and institution-wide basis. Subordinate units differ widely in their age and rank distribution, in retirement rates, in enrollment trends affecting them, etc. A college or university faculty is not a collection of freely interchangeable parts. To be useful, staff planning must take these differences into account, providing, for example, for orderly shifts of resources from one unit to another, insuring the minimum critical mass needed to sustain quality programs, and pooling vacancies under central control as a hedge against contingencies.

   The plans of subordinate units--departments, divisions, etc. --and of the institution as a whole must be disseminated and understood (it will of course not always be universally agreed to). There must be procedures for revisions to be proposed by units which believe that the plan is defective. All of this is essential if the plan is to be an effective guide for recruitment, reappointment and the award of tenure in the years ahead.

2. Criteria for Appointment, Reappointment and the Conferral of Tenure. At the heart of any tenure system is assessment of the probationary faculty member's qualifications for effective long-term service in the institution. The assessment--normally made by senior colleagues in the first instance--is made on the basis of criteria appropriate to the discipline and the institution. The more appropriate the criteria to both discipline and institution ("is he a really competent geologist?", "is he a competent geologist who can be expected to make a long-term contribution in this institution?"--the two questions are not the same), and the more objectively and consistently they are applied, the better will be the crucial assessments and the stronger the tenure decisions.

Often, unfortunately, the criteria employed are inadequate to the kinds of judgments that must be made; they are too often not well understood either by the judges or those being judged; and they are too often applied inconsistently. Criteria are often stated in the largest, most general institution-wide terms, such as the traditional requirement of demonstrated ability in teaching, research and service, without attention to the specification of these tenures in different disciplines and without clear indication of the relative importance that is to be attached to them. Probationary faculty are not always informed of the criteria on which they will be judged. Stated criteria are often modified in the assessment process, as when in an institution committed essentially to undergraduate teaching, probationary faculty are in fact judged primarily on the basis of their scholarly productivity, or what is just as bad, believe themselves to be. Judgments are often made not on the basis of explicit institutional criteria but on the basis of current trends in the discipline at large which happens to be in fashion among some influential members of the department, whether or not they are appropriate to the institution.

Institutions--and their subordinate elements--therefore need to make sure that their criteria for recruitment, reappointment and the award of tenure are reasonably explicit, that they allow for appropriate variation among units having significantly different roles in the institution, that they are carefully communicated and understood by everyone involved in the assessment process, that they are consistently and objectively applied, and that above all they reflect the institution's determination to fulfill its mission with the highest standards of quality.

3. Evaluation of Faculty Performance. In what has just been said, the emphasis was on the development and application of criteria for the assessment of the qualifications and future promise of faculty members on probationary appointments, as the basis for the award of tenure or for termination of appointment.

But it is not only the performance of probationary faculty that should be evaluated on a regular and systematic basis.

Faculty performance should be evaluated at all levels, tenured as well as non-tenured. Of course, the performance of tenured faculty has always been evaluated in some sense--for further promotion, for merit raises, for course assignments, for leaves of absence, for grant support, to mention only a few. Too often, however, such evaluation is sporadic, casual, ad hoc and not necessarily related to the primary missions of the institution. Evaluation of senior faculty does not always include attention to the quality of undergraduate--especially lower-class (freshman and sophomore years)--teaching, to development of new courses, to the quality of supervision of advanced and graduate students, to assistance to junior faculty in their professional development, and to related matters that promise to be of great importance in the decade ahead. Faculty performance should be evaluated on a regular basis and in terms of a reasonably clear set of criteria and procedures, which should be reviewed and modified periodically. Special attention should be paid to student evaluation of teaching. Evaluation procedures should include measures designed to assist faculty members to improve their performance and positive incentives to do so. There should be regular arrangements for follow-up to insure that deficiencies in performance are made good.

4. Professional Development. The report of the Commission on Academic Tenure in Higher Education gave special emphasis to this seriously neglected area.

> In any college or university, ways must be found to foster the professional development of the faculty. This involves such purposes as the following: encouraging faculty interest in good teaching and in rewarding it, promoting improvement in teaching methods, maintaining at a high level the faculty members' interest in new generations of students and minimizing boredom and fatigue, helping faculty members keep abreast of new developments in their disciplines, providing opportunities for interaction with colleagues in other institutions, providing opportunities for periodic refreshment and retooling, assisting those who want to change fields or develop new lines of teaching or investigation, encouraging those who want to take on administrative responsibilities and helping them prepare themselves for such assignments, providing the means by which those who have served in administrative positions can make a successful transition when they return to regular faculty service. These and related objectives should be the goals of a professional development program. (Faculty Tenure, p. 51)

Few institutions have well-developed professional development programs. In most, it is a catch-as-catch-can affair, the individual

faculty member being left largely to shift for himself, with such time and resources as he can find. In fields that enjoy substantial support from government or the private sector, professional development opportunities have been most abundant, but by no means in all institutions. And such support has commonly emphasized research and graduate study to the neglect of the improvement of undergraduate teaching, the development of new or improved programs and the facilitation of mid-career change by faculty members.

Institutions should consider deliberate investment in a well-thought-out professional development program, adapted to the institution's special mission and keyed to the needs of the faculty and the availability of development resources outside the institution. The Texas legislature should provide funds for the faculty development program already authorized but never funded. College and university administrative officers should be guided in the allocation of special funds from government or private sources by a determination to assist in the professional development of the faculty.

5. Faculty Responsibility for an Effective Tenure System. The faculty--especially the tenured faculty--plays the most critical role in making a tenure system work effectively. In every well-conducted institution, the faculty makes the substantive decisions on who will be appointed; it monitors the performance of probationary faculty and gives them counsel and assistance; it makes recommendations on reappointment and on conferral of tenure; it recommends subsequent promotions; it evaluates periodically the performance of its own tenured members. The faculty must accept these responsibilities. Indeed, the faculty must insist upon them, justifying its insistence by the care, the vigor, the professionalism and the concern for the institution's welfare with which it discharges them. If it does not do so, the result is predictable because it has happened so many times; a weak faculty, conflict between faculty and administration, a mediocre institution, and a decline of educational standards.

The faculty responsibilities listed above are in the nature of the case inherently difficult. They involve judgments about colleagues and friends; they require careful weighing of such imponderables as future promise; they require consensus among professionals of differing backgrounds, interests and prepossessions; they necessitate ordering priorities in themselves difficult to define, such as the capacity for leadership and the capacity for innovation; and they require at least rough agreement on the mission of the institution and the best ways to achieve it. We have already begun to see that these inherent difficulties are made yet more difficult by the conditions outlined at the beginning of this report, conditions which will undoubtedly characterize the 1980s.

There will have to be much more careful selection of new appointees. Criteria for reappointment will have to be more rigorously applied than they have been in the past. Since in most institutions there will be fewer openings at the tenure ranks, recommendations for tenure will have to be made with a new stringency in the application of institutional standards. A new emphasis will have to be given to teaching skill and the ability to experiment and innovate. The faculty will have to scrutinize its own performance more carefully than it has ever done in the past, and it will have to find ways to remedy the deficiencies it finds.

If these things are to be done, there will have to be a much closer and more open collaboration between faculty and administration than is to be found in most institutions. Faculties must not lay themselves open to the charge--as they often have, with justification, in the past--that they pass the buck in difficult decisions to the administration. It is only in the management of difficult decisions that the strength of a faculty is displayed. For their part, administrators must not lay themselves open to the charge--as they often have, also with justification--that they disregard faculty recommendations, or provide no explanation for rejecting them or usurp the proper role of the faculty by proceeding unilaterally in appointments and promotions. In many institutions, perhaps in most, a new partnership between faculty and administration will be required in the 1980s, a partnership in which they work together to develop a staffing plan for the years ahead and then collaborate in the personnel decisions needed to make it work.

6. Special Topics:

a. Non-tenure-track faculty. Many institutions, in Texas and throughout the country, have begun making two classes of appointments of new faculty--tenure-track appointments, with a period of probationary service and eligibility for tenure in the traditional manner, and non-tenure-track appointments, for--presumably--limited contract service, without eligibility to be considered for tenure. It is easy to see the attraction of this device at a time when relatively few tenure appointments can be made: by restricting the number of probationary appointees, it appears to increase their prospects of achieving tenure, thus making initial appointment not much less attractive than in earlier years.

But it is also easy to see that this two-track system is full of perils. The deliberate creation of two levels of faculty, one with a real stake in the institution and the other without, is sure to create morale problems, especially since those on the non-tenure track are usually paid less and required to teach more. Teaching quality, it is reasonable to suppose, will suffer: the non-tenure-track faculty

will be less qualified (if not, why not appoint them in the regular way?); they will not be as carefully supervised, since they will not come up for promotion; they are not likely to have a high and sustained interest in an institution or its students, knowing that they have no future there.

Other problems suggest themselves. Some institutions place a definite limit on the number of years a non-tenure-track appointment may be held, but others apparently do not. (A study of tenure practices which the American Council on Education will publish this fall shows that institutions "expect" non-tenure-track appointments to last three to four years, but it is not clear whether this "expectation" rests on institutional policy or on a guess as to the behavior of such appointees.) If a non-tenure-track appointment were simply renewed again and again--as we have seen, this is the norm in contract arrangements--then a situation might evolve in which a tenure-track appointee, initially selected with greater care and more carefully supervised and evaluated during the probationary period, no doubt paid a substantially higher salary and given more varied teaching assignments, might nonetheless fail to achieve tenure and leave the institution, while his less carefully-selected opposite number on the lower non-tenure track stayed in. Unless the most careful controls on length of service are developed and enforced, and unless the proportion of non-tenure-track appointments is held to the absolute minimum to meet a temporary crisis, it is easy to predict that an institution which appoints substantial numbers of non-tenure-track faculty is opting for mediocrity in the future. Unless, of course, the purpose is gradually to erode tenure in the institution. Faculties and administrations must be mindful of these dangers and must develop policies to govern non-tenure-track appointments so that quality will not be lowered, whether by inadvertence or design.

b. Part-time appointments. Part-time appointments have long been a means by which institutions could cope with unforeseeable shifts in enrollment and avail themselves of teaching talent they could not secure on a full-time basis. The question whether part-time faculty should be eligible for tenure, and if so under what conditions, is difficult and complicated. Some institutions have adopted policies that permit the award of tenure to part-time appointees. The question is discussed at some length in Faculty Tenure (1973), pp. 78-81, referred to above.

On the other hand, part-time appointments are sometimes used to avoid making regular appointments which carry full eligibility for consideration for tenure. This is simply a variant on the non-tenure-track appointment, sometimes involving such absurdities as appointments for .80 or .90 time, which not being full-time makes the appointee ineligible for

tenure. The strictures on non-tenure-track appointments made in the preceding section apply to such uses of part-time service as well.

c. Roles relating to tenure for the Coordinating Board. Having issued a revision of its Policy Paper No. 1, "On Academic Freedom, Tenure, and Responsibility," the Coordinating Board might wish to consider the following actions having special relevance to academic tenure in the 1980s:

1. It might prepare and circulate information or guidelines on staff planning and related matters for the use of institutions under its purview.

2. It might sponsor or support seminars or workshops on staff planning, the management of tenure systems, etc., at which faculty and administrators of Texas institutions could hear and exchange views with knowledgeable people from other institutions and from the national educational organizations.

3. It might sponsor a study assessing contract systems as suggested earlier in this paper. Certainly the Board should do so before it decided to support any contract system.

4. It might reconsider the funding formulas currently used to determine appropriations for Texas public colleges and universities, with a view to insuring that undergraduate education, and especially lower-class education, is funded at levels that will permit it to be carried out with full institutional and faculty commitment, and to levels of excellence, that current funding formulas assure only for graduate and professional education. (Of course, this is only in part a problem with the formulas, for in the end, it's how the institutions budget the funds received under the formulas that determines the emphasis or lack of emphasis given to undergraduate teaching.)

5. The Board should be very reluctant to lend support to any statewide changes in the tenure system in Texas which would take Texas institutions out of the mainstream of American higher education.

RESEARCH: ITS IMPORTANCE FOR TEXAS UNIVERSITIES AND FOR THE STATE OF TEXAS

by H. Eldon Sutton

Research--how often it is invoked to solve our problems and blamed for having created those same and other problems! We are exhorted by persons on television to abandon the activities of modern society and return to a Thoreau-like existence, practicing life-styles consonant with the principles of ecology, as revealed by the latest research. In spite of such paradoxes, we expect research to give us the answer to almost any question we can pose.

The priority we give to research has been evident in many ways. More research will put man on the moon. (It did.) More research will find a cure for cancer. (It hasn't, but many persons now living are testament to the progress in understanding cancer.)

The public perception of research is generally very positive. Research can solve any problem! This attitude appears in various polls. For example, Congressman J. J. Pickle distributed a questionnaire to voters in the 10th Congressional District. One question was, "If federal spending is reduced, what areas should be recommended for lowered funding?" Of 16,000 replies, four percent said research and development, the lowest percentage for any item. The public believes support of research can solve our problems. It is one of the most important functions of government.

Research in universities has been viewed somewhat less sympathetically. This is because research often is seen to be in competition with teaching. This view is not sustained by fact, however. Research has an important integral role in higher education. It must be supported spiritually and financially if Texas is to have the universities it wants and deserves.

Research is an essential part of education.

The three functions of higher education are often said to be teaching, research and public service. These are the three areas in which higher education makes major contributions. But it is wrong to think of these contributions as three separate activities. As Howard R. Bowen has expressed it:

> Not only are the three functions of education, research, and public service carried on jointly; they are often mutually supportive. Education may be enriched if it occurs in the environment of discovery, intellectual excitement, and contact with the real world and its problems. Similarly, research and public service may be enhanced when they are combined with instruction. This does not imply that every community college or liberal arts college should become a great research center. Nor does it deny that universities can overdo research and service to the neglect of instruction. It implies only that the spirit of inquiry and public service enriches academic enterprise and lends coherence and unity to the American system of higher education.[1]

Virtually all university research occurs as part of the educational process. Research on occasion is carried out by research staff and faculty without direct involvement of students, simply because the talent required to solve an urgent public problem exists at a university and not in other sectors. Few organizations other than a university have the enormous array of talents and interests found in a university. But it is very uncommon for university research not to involve students.

A major goal of education is to teach students to think critically--to become informed persons able to think independently. But knowledge is constantly evolving; "facts" are tentative. The theory of gravitation developed by Newton worked well for the velocities and masses of Newton's time. But Einstein's theory of relativity is needed for velocities approaching the speed of light. The economic theories that govern a dispersed agricultural society must be modified for a high-density industrial society.

Knowledge must constantly be renewed, and it is the development of that new knowledge that we call research. Education is learning to ask questions that will lead to knowledge, sometimes new knowledge. This country did not become great by slavishly accepting the prevailing beliefs. Individuals were willing to question, to experiment and to reach independent conclusions. This is the essence of education, as it is also of research.

Research in a university occurs in a variety of ways appropriate to the goals of the institution and the level of the students. We do not ordinarily think of undergraduates as being strongly involved in research. Yet they are learning to inquire, learning how to formulate questions that can be answered and learning what questions have been asked before. One characteristic of a great undergraduate teacher is the ability to infuse these elements into a subject, to create an environment in which students experience the excitement of discovery, even if the path is well marked by scholars who have gone before.

The special purpose of graduate education is to develop advanced scholars, persons who not only know a field in depth but also can advance the knowledge in that field. Graduate research is concerned with questions that have not been answered before or whose answers can be improved. In short, graduate education is learning to solve problems independently. Working with an experienced faculty member, a student masters the knowledge in a chosen field, learns what problems have been solved, learns how to formulate questions and experiments that will yield new answers and insights and learns how to collect the information needed for the answer and to analyze that information.

If the problems of tomorrow are to be solved, it will be necessary to train persons to solve them. This occurs only by letting students participate in research as part of their education. One can no more train researchers in chemistry or engineering in the classroom alone than one can train persons to drive a car without behind-the-wheel experience. One learns to be a scholar by practicing scholarship.

Research is important to excellence in teaching.

Just as research has often been contrasted with teaching, the ability to do good research and the ability to be an excellent teacher have been

presented as incompatible traits. This just isn't so. There are indeed persons who excel in research and do not perform well as teachers, even at the graduate level. And there are excellent undergraduate teachers who do not do research. But many do both well.

The persons best suited to a particular institution will depend on the goals of that institution. It is essential that faculty responsible for graduate education be active scholars and researchers. But undergraduate teaching can also benefit greatly by participation of researchers. This point was well stated in a study paper prepared for the Coordinating Board:

> A university, concerned as it must be with the quality of its instruction and with the true educational service which it provides, is keenly aware of the quality and scope of research carried on by its faculty. University professors find it very difficult to remain abreast of new developments and to be effective in teaching and training of students unless they are allowed to pursue research in their fields of interest. In case after case, those professors chosen by students as outstanding teachers are those who have consistently been involved in meaningful research and are intimately involved with the discovery and interpretation of new knowledge.[2]

One characteristic of all great teachers has been their interest, indeed their fascination for a particular subject. How can a person captured by the subject matter refrain from exploring, questioning, learning more? Such enthusiasm is infectious and can do more to generate student interest and learning than a carefully argued but impersonal presentation.

While one may accept research for its own sake and one may argue that an active research program leads to quality education, is there evidence to support this assertion? One approach to this question is to identify the major universities involved in research and see to what extent they comprise the institutions noted for quality. Table 1 gives the top 25 U.S. institutions for fiscal 1977 by total expenditures for research and development. The exact ranking is influenced by institutional size, whether the institution has a medical school or an agricultural school, etc. It is noted that these 25 institutions spent 40.8 percent of all science and engineering research dollars and 43.5 percent of all federal research dollars in these areas. One can debate the rank of institutions based on academic quality, but most would agree that this list of 25 includes a very high proportion of top quality institutions.

Such an association between quality of institution and research expenditures does not mean that pouring more money into research will automatically assure quality. Quality ultimately depends on the willingness of institutions to set high standards and to demand high-quality performance on the part of faculty and students. But high-quality faculty attract research support, as recognized especially by the ability to compete for limited federal funds.

It is well to recall at this point that research is especially important to institutions that have responsibility for graduate education. Institutions whose primary goal is a strong undergraduate program cannot be expected to have research programs as strong as those of graduate institutions. But even in primarily undergraduate institutions, faculty should maintain respectable research if they are to communicate to students the enthusiasm for scholarship and the evolving nature of knowledge.

Table 1. Total and federally financed research and development (R&D) at universities and colleges, fiscal 1977.[3]

(Figures are in thousands of dollars)

Institutions ranked by total R&D expenditures	Total R&D expenditures	Federally financed R&D expenditures
1. University of Wisconsin-Madison	103,556	53,386
2. Massachusetts Inst. of Technology	102,045	85,066
3. University of California-San Diego	86,636	78,719
4. University of Minnesota	82,679	48,409
5. University of Michigan	79,922	50,908
6. University of Washington	77,757	66,066
7. Stanford University	77,019	71,115
8. Harvard University	73,301	55,485
9. Columbia University	72,948	58,973
10. Cornell University	71,346	45,895
11. University of Pennsylvania	70,721	47,313
12. University of California-Berkeley	70,148	50,197
13. University of California-Los Angeles	69,277	55,956
14. Johns Hopkins University	61,858	50,445
15. University of Chicago	59,332	46,109
16. University of Illinois-Urbana	59,320	40,558
17. University of Rochester	53,129	33,502
18. Texas A&M University	51,810	21,757
19. University of Texas at Austin	49,699	30,118
20. University of California-San Francisco	49,677	41,220
21. Michigan State University	48,058	22,948
22. Yale University	47,887	42,237
23. University of California-Davis	47,191	24,044
24. New York University	45,789	36,922
25. Ohio State University	45,367	24,559
Total, top 25 institutions	1,657,472	1,181,907
Total, 539 U.S. institutions surveyed	4,064,220	2,716,767

Universities have a special responsibility for research on basic principles.

Research is carried on by private organizations, including industrial companies involved in manufacturing and services, as well as in universities. In 1977, the most recent year for which figures are available, private industry in America spent $29.9 billion on research and development, 2.0 percent of net sales.[4] This is compared to $4.1 billion spent by universities. With such a disparity, are universities really "in the game?"

The answer is "very much so." Industrial research is oriented toward product development. Turning an idea into a new product may require large expenditures for research and development. Companies understandably are less interested in supporting basic research whose applications may well prove more beneficial to another industry. Many companies, of course, have outstanding records of support of basic research, either in-house or through awards to universities and research institutes.

Universities, by contrast, are especially concerned with research that leads to better understanding, whether of the principles of atomic structure or the principles of building better bridges. The research often does lead to better products or practices, but the particular application that may result often cannot be anticipated when the research is initiated. Work on certain mutant forms of bacteria was carried out in order better to understand gene structure and function. Some of the mutants developed in the course of that work are now used to test for chemicals that cause cancer, a test that is widely used in industry in the development of new chemical products. Other work on bacterial gene structure served as the basis of genetic engineering. As a result, we are on the verge of producing unlimited quantities of human insulin and interferon in bacteria. Work done in Texas on radiation damage to chromosomes in fruit flies was used to develop the procedure of releasing sterile screw worm flies to control natural infestations of this insect. Absence of control has cost Texas ranchers hundreds of millions of dollars in lost cattle. That same basic work helps in our understanding of the effects of nuclear irradiation on human populations. The economic benefits of these and other examples would pay for the basic research many times over.

A distinction is often made between basic and applied research. However, there is no sharp dividing line between research that is directed to the solution of specific problems and research directed to greater understanding of natural phenomena. Research on an urgent problem of society may identify deficiencies in basic understanding that must be resolved. Findings of basic research may suggest solutions to practical problems quite removed from the impetus for the research. Both basic and applied research are the proper concern of universities and coexist, even in the same laboratory or research group. University research complements and provides the foundations for industrial research. The latter, in turn, helps define the areas in which greater general understanding is needed, understanding that so often comes from university research.

University research is an excellent investment for the state.

Research benefits the Texas economy directly by bringing dollars into the state for the conduct of specific research. The total amount of research carried out in institutions of higher learning can be measured only in part

by dollars spent. Much, such as research in the humanities, depends on availability of library materials and does not require separately identifiable financial support. Many research areas do require separate funding, and it is instructive to consider the size of external versus appropriated funds that support research.

Table 2 summarizes the amounts and sources of funds spent by Texas universities on research in 1979. For the fiscal year ending August 31, 1979, over $241 million was spent on research by the Texas public colleges, universities and health science centers. A majority of these funds, over $143 million, was from federal sources, the remainder from state appropriations ($53 million), private nonprofit organizations ($20 million), private companies ($10 million) and other sources ($16 million). Ten academic institutions spent over $1 million for research, The University of Texas at Austin and Texas A&M University being the largest. Six of the health science centers spent over $1 million, The University of Texas Cancer Center being the largest.

Table 2. Expenditures for research by public institutions in Texas[5]

(Figures in millions of dollars)

Fiscal Year	Source of Funds			Total
	State Appropriations	Federal Agencies	Other Sources	
1975	34.2	84.9	27.3	146.4
1976	39.6	94.7	32.3	166.6
1977	46.1	111.0	32.9	190.0
1978	54.1	93.7	71.5	219.3
1979	52.9	143.2	45.8	241.9

Most of that money was spent within the state. If we accept the figures from UT Austin as typical, 47.6 percent of that amount was for salaries and wages. Therefore, some $70 million was paid in salaries to Texans to work on federally sponsored research, money that went to students and staff and for summer salaries and released time for faculty. An additional $30 million estimated indirect costs boosts the staff payrolls still further.

Thus university-based research is a major industry in Texas. It is especially significant since so much of the money spent on research would not otherwise come to the state. For every dollar appropriated for research, nearly two additional dollars are generated, mostly from out of state. Returning a fair share of tax dollars to Texas may not be a prime purpose of Texas universities, but it is at least a fringe benefit.

Research benefits the Texas economy by attracting high technology industry.

Universities are seldom viewed for their contributions to the economy of the state as a whole. Yet, many contemporary critics regard universities, and especially their research programs, as important factors in the economic well being of the nation. Our competition in international markets is dependent in part on high techology development and manufacture. The shift from blue collar to white lab coat is likely to continue, and indeed must, if we are to remain competitive. Peter Drucker, in reviewing the changing industrial complexion of America, recently noted, "The shift to knowledge-based manufacturing is the only way to expand employment in this country without worsening inflation."[6]

But knowledge-based manufacturing remains competitive only so long as it is changing and improving. A better and cheaper computer rapidly displaces older versions from the marketplace. Manufacture of human insulin by genetically engineered bacteria will rapidly displace slaughterhouses in the care of diabetics. Progress in these areas does not come from inventors and tinkerers working in the basement on long winter evenings. It has been a long time since an airplane was designed in a bicycle shop.

Progress occurs because highly trained and creative scientists and engineers have the imagination to see what is possible and the skills to turn their ideas into realities. We must have highly educated persons who know how to ask important and relevant questions and who know how to get the answers. As Dr. Charles E. Bishop stated in testimony before the Coordinating Board, "If we are to expand and maintain our competitive position in knowledge work, we must place greater emphasis upon research. Indeed, it is from the research base of our universities that the knowledge to cope with the challenges of the 1980s and 1990s will come." That knowledge will come both in the form of research carried out at universities and in the form of students trained there in research.

The importance given to research and development by industry is indicated by the money spent for that purpose (Table 3). The federal funds do not include research carried out directly by federal agencies but include all federal grants and contracts awarded to companies and institutions. Nearly one billion dollars was spent in Texas, much in defense and energy-related research supported by the federal government. But nearly $500 million came from nongovernmental sources, primarily from the companies' own funds. This latter figure is over twice the total spent by Texas universities and reflects the high technology of much of Texas industry.

Texas has been a major host for and beneficiary of the high-technology industries. The long-established chemical industry, the space program and the computer and electronics industries have all made the Texas economy resilient in the face of economic recession. This can remain the case only if these industries can have access to the latest research and be assured of a supply of trained scientists, engineers, economists, etc., persons who have done their research apprenticeships in universities.

According to figures assembled by the National Academy of Sciences, there were 295,800 scientists and engineers who received their PhDs in the period 1934-1976 and who were in the United States in 1977.[8] Of these, 280,200 were in the "labor force" at that time. Texas could claim 13,603 of those in the labor force, or 4.85 percent. Roughly half of them were

Table 3. Research and development expenditures in Texas, fiscal 1977.[3,4]

(Figures in millions of dollars)

Expenditure	U.S.	Texas
Industrial R&D		
Total	29,907	958
Federal funds	10,545	465
Private funds	19,362	493
University R&D		
Total	4,064	228
Federal funds	2,717	140

associated with universities, and a quarter were with private industry. During that same period, Texas universities, public and private, produced 3.3 percent of the U.S. PhDs.[9] Thus Texas historically has been a "consumer" of trained researchers. By 1977, 4.7 percent of the U.S. doctorates came from Texas institutions.[8,10]

The attraction of high-technology industries to the neighborhood of research universities is demonstrated by several well known examples: the electronics companies that have located on Route 128 near Massachusetts Institute of Technology, the computer and related high-technology industries near Stanford University, the cluster of industrial and government research laboratories in Research Triangle Park, North Carolina, located in the area bounded by the University of North Carolina at Chapel Hill, North Carolina State University at Raleigh and Duke University. In some instances, companies have formed as a direct spinoff of university research. In others, existing companies moved their research laboratories to be near a university to benefit from the opportunities to consult with faculty and to hire students.

Many high-technology industries are in Texas, in part, because of proximity to our research universities. Texas industry and the universities have had an excellent, mutually beneficial relationship. It is impossible to measure the importance to the Texas economy of research contributions made by universities in collaboration with industry. The more than $10 million of contracts and grants in fiscal 1979 from private profit organizations to universities for research support is a minimum indication of the benefits anticipated by these private companies.[5]

As we move to greater reliance on knowledge-based industry, the clustering of industrial manufacturing and research around major research universities is likely to increase. Much of the research needed to stay abreast of technical developments is conducted in universities. Many of the workers will be persons with college degrees or students working part time. And many of the firms contemplating relocation prefer places where their employees can

undertake further studies to improve their own career opportunities and benefit the company as well.

Texas must move ahead in research--or fall behind.

Texas has been the beneficiary of excellent natural resources, of which energy is especially notable. This has allowed the state and its universities to move ahead at a time when other parts of the country were facing much greater economic instability. But selling energy derived from fossil fuels is an activity with continually diminishing returns. We therefore must use the time that we still have to develop other resources, most notably the mental resources of our young citizens. Only in this way can we meet the challenges and solve the problems of tomorrow. This need has been nowhere better expressed than by Ambassador Edward A. Clark:

> Leading Texas through the remarkable decades ahead will be a task requiring statesmanship, foresight, and--equally important--the very best research and the very best training that we can provide. Without such research, we are always the captives of inadequate and out-of-date information; without such research, we are denied the innovative cutting edge which permits progress. Just as there is very close correlation between careful research and great teaching so there is an equally close tie between great research and the possibilities of a sound and promising future.[11]

NOTES

[1]Howard R. Bowen. Investment in Learning. Jossey-Bass, San Francisco, 1977. 507 pp.

[2]The Critical Role of Organized Research in Texas Higher Education. Study Paper 13, Coordinating Board, Texas College and University System, 1972.

[3]Expenditures for Scientific Activities at Universities and Colleges, Fiscal Year 1977. Detailed Statistical Tables. Publication NSF 78-311. National Science Foundation, Washington, D.C., 1978.

[4]Research and Development in Industry, 1977. Technical Notes and Detailed Statistical Tables. Publication NSF 79-313. National Science Foundation, Washington, D.C., 1979.

[5]Information compiled from annual reports on research, Coordinating Board, Texas College and University System.

[6]Peter F. Drucker. The "Re-Industrialization" of America. The Wall Street Journal, June 13, 1980, p. 10.

[7]Charles E. Bishop. Testimony before the Coordinating Board, Texas College and University System. Arlington, Texas, June 19, 1980.

[8]Science, Engineering, and Humanities Doctorates in the United States: 1977 Profile. Commission on Human Resources, The National Research Council. National Academy of Sciences, Washington, D.C., 1978.

[9]A Century of Doctorates. Commission on Human Resources, National Research Council. National Academy of Sciences, Washington, D.C., 1978.

[10]Texas Higher Education in Transition. Coordinating Board, Texas College and University System, 1978.

[11]Ambassador Edward A. Clark, from remarks given during the Pre-Session Legislative Conference, Austin, November 30, 1978. (Published in Discovery, Volume 3 (No. 2), pp. 2-3, The University of Texas at Austin.)

COLLECTIVE BARGAINING IN TEXAS HIGHER EDUCATION IN THE 1980s

by Milden J. Fox, Jr.

Collective bargaining in higher education began approximately 15 years ago. In this short period of time there has been considerable advancement in its development. This growth has not been without problems and obstacles, many of which are still here today. This paper will look at the growth and development of collective bargaining in the national and Texas fields of higher education, examine where it is today, review the major problem areas that exist and evaluate the effects and results of these developments. In addition, an attempt will be made to delve into the future and predict what is in store for collective bargaining in Texas higher education.

Background

Beginning with the Norris-LaGuardia Act of 1932, federal labor relations laws have provided the framework for private sector labor relations[1] and also have been used as a guide by the various states in the development of their public sector labor laws. The Wagner Act or National Labor Relations Act of 1935 created the National Labor Relations Board (NLRB) and required that management had to bargain with unions. In 1947 the Taft-Hartley Act attempted to redress the balance of power between unions and management. This law was followed by the Landrum-Griffin Act of 1959, which primarily addressed the administration of unions. In 1962 Presidential Executive Order 10988 extended the right to organize and bargain to a majority of federal employees. These federal labor relations laws and the executive order have led the way in the overall growth and development of public and private sector labor relations (other than in the industries covered by the Railway Labor Act).

The NLRB's involvement in higher education collective bargaining came as a result of the Cornell University case of 1970.[2] The decision stated that NLRB jurisdiction was extended to private institutions of higher education because of their impact on interstate commerce and the expanding federal interest in the field of higher education.[3] All private institutions with a gross annual revenue of one million dollars were affected. This dollar volume encompasses over 80 percent of private institutions in the United States. In spite of the supportive federal legislation, collective bargaining in private institutions has developed at a slower pace than public institutions. This can be attributed to the smaller more independent nature of private colleges and universities and the lack of attention given them by labor organizations which, instead, have been more interested in the organization of the larger educational systems in the public sector.

Even though federal statutes and executive orders have been the pacesetter for labor relations nationwide, public institutions of higher learning have depended on their individual states to enact enabling collective bargaining legislation. "Permissive legislation is the key explanation for the burst of academic unionism"[4] in the public sector, as demonstrated by the rapid growth of union activity in New York State.

However, not all states have legislation that encourages or even authorizes collective bargaining in the public sector. Texas public employees, including those in higher education, are governed by V.A.C.S. Art. 5154c. This law prevents public employers, other than firemen or policemen, from entering into a contract with any bargaining agent and prohibits the employees from participating in strikes. Article 5154c does allow for grievance rights through a representative which does not claim the right to strike. Even with the diverse and sometimes prohibitive laws of the 50 states, faculty unions have had their greatest success in public institutions.

"Collective bargaining in higher education found its earliest acceptance in the public two-year colleges."[5] Collective negotiations in two-year colleges began in 1966 at Henry Ford Community College in Dearborn, Michigan. The great success of unionization in these institutions can be attributed to their similarity to secondary education, low salaries, lack of faculty governance and lack of academic freedom. In addition, the following characteristics appear to influence these faculty members toward collective bargaining participation:

1. General lack of academic tradition;

2. Predominance of secondary school teachers on the faculty;

3. Personnel policies patterned after secondary schools;

4. No clear working definition of a community college faculty; and

5. Lack of professional mobility.

In 1969 at City University of New York (CUNY), collective bargaining had its beginning in four-year institutions. Further collective bargaining development has found its greatest acceptance at "emerging" four-year colleges where rapid growth has taken place. These colleges have less identity and participatory management than the more prestigious universities.[6] There are numerous reasons why these emerging colleges' faculty members have turned to collective bargaining:

1. Faculty governance rights are often unwritten and unenforceable, and at many institutions participatory management lacks any real power.[7]

2. In an attempt to reduce cost and increase administrative control, administrations have tampered with traditional procedures for achieving tenure.

3. And in general, faculties unionize for the same reasons as everyone else--better salaries, job security and improved working conditions.[8]

4. Finally, Dr. Zeller of CUNY believes that faculties organize in an effort "to raise their economic and professional status, to protect their collective and individual rights and to protect the educational quality of their institutions."[9]

What has been the overall result of collective bargaining efforts in higher education? First, in the area of two-year colleges (including both

community and junior colleges), where the movement began, most faculties now enjoy working conditions similar to their counterparts in the four-year institutions. In many cases, as a result of collective bargaining, they now have job protection through effective grievance procedures, control over individual assignment of workloads and contract insurances of academic freedom. Two-year colleges also have obtained equal fringe benefits and in many cases have higher salary schedules than many senior colleges.[10]

There also have been substantial advancements in some four-year colleges and universities as a result of collective bargaining. In addition to the more conspicuous improvements in the areas of salaries and fringe benefits, contractual agreements have reduced administrative unilateral decision-making powers and caused a corresponding increase in bilateralism in the form of faculty governance. At CUNY the union has insured equitable tenure procedures and protected faculty rights in the area of faculty governance. In these efforts at CUNY, the union has not attempted to replace faculty decision-making but, rather, has strived to furnish protection against the erosion of these rights.[11]

There is little argument doubting the improvements of two-year college salaries and fringe benefits resulting from unionization; however, some question has been raised in this regard at four-year institutions.

In a study conducted by Joan L. Marshall, it was concluded that there is little difference, if any, between salary increases at union and non-union institutions.[12] Proponents of collective bargaining reject these findings with the argument that in order to be competitive with union-organized schools, non-union institutions have raised their salaries to a comparable level. In addition, some institutions have attempted to prevent unionization by providing substantial salary increases in order to reduce the union's attractiveness.

As of June 1980, 681 campuses of higher education had chosen to be represented by collective bargaining agents, and 82 had rejected unions through representational elections. Table 1 provides current data as to the breakdown of union representation, and when compared to Table 2, indicates the growth and distribution that has occurred in the past five years. There has been a growth in collective bargaining of almost 300 new schools in this five-year period; approximately 85 percent of the campuses are public institutions, and 60 percent are two-year campuses. The growth of collective bargaining in higher education also is shown in Table 3, which demonstrates its overall development.

J. Garbarino sees a recent slowing trend in the growth of collective bargaining in relation to what experts in the field had expected, and he attributes this to the slow rate of additional public sector supportive and enabling legislation. Since 1975, only two states have passed legislation extending bargaining rights in higher education.[13]

Proponents of collective bargaining attribute the need for and the growth of unionism to the following:[14]

1. Prestigious institutions and professors are a minority in the field of higher education.

2. Shared authority and self-governance are a myth for the majority of professors who are nontenured, lower ranking and need the protection of collective bargaining.

3. Real collegiality does not exist, and faculty members are employees of the institution.

4. Collective bargaining will provide better review and formal grievance procedures through effective arbitration.

5. Third-party arbitration is needed and can be as effective as it is in industry.

TABLE 1

GROWTH OF COLLECTIVE BARGAINING
IN HIGHER EDUCATION
INSTITUTIONS WITH RECOGNIZED BARGAINING AGENTS
JUNE 1980

	4-Year Campuses			2-Year Campuses			Grand Total
	Public	Private	Total	Public	Private	Total	
American Ass'n. of University Professors	23	31	54	9	1	10	64
American Federation of Teachers	74	26	100	136	6	142	242
National Education Ass'n.	52	16	68	231	5	236	304
A.A.U.P.-A.F.T.	14	0	14	0	0	0	14
A.A.U.P.-N.E.A.	2	0	2	7	0	7	9
Independent and other	5	10	15	32	1	33	48
TOTAL	170	83	253	415	13	428	681
Bargaining rejected	25	40	65	14	3	17	82

SOURCE: "FACT FILE," THE CHRONICLE OF HIGHER EDUCATION, JULY 7, 1980, p. 8.

TABLE 2

GROWTH OF COLLECTIVE BARGAINING
IN HIGHER EDUCATION
INSTITUTIONS WITH RECOGNIZED BARGAINING AGENTS
JUNE 1975

	4-Year Campuses			2-Year Campuses			Grand Total
	Public	Private	Total	Public	Private	Total	
American Ass'n. of University Professors	13	19	32	2	1	3	35
American Federation of Teachers	18	9	27	66	3	69	96
National Education Ass'n.	38	8	46	100	2	102	148
A.A.U.P.-N.E.A.	2	0	2	7	0	7	9
N.E.A.-A.F.T.	33	6	39	24	0	24	63
Independent and other	3	5	8	25	1	26	34
TOTAL	107	47	154	224	7	231	385
Bargaining rejected	6	29	35	5	1	6	41

SOURCE: "FACT FILE," THE CHRONICLE OF HIGHER EDUCATION, JUNE 10, 1975, p. 5.

TABLE 3

	1965	1971	1975	1980
Total Number of Campuses Participating in Collective Bargaining	0	133	385	681

SOURCE: CHRONICLE OF HIGHER EDUCATION

On the other hand, what is the reasoning of the opponents of collective bargaining and the possible explanation for the rejection of one in every four elections in the public sector and one in every two elections in the private sector?[15] This question is addressed by the following:

1. The advances made by professors in regard to status, income and power mitigate against collective bargaining in higher education.

2. There is a lack of identity with traditional unions, which are viewed as unprofessional.

3. Senior professors fear the principles of professionalism will be sacrificed through the "leveling process."

4. Collective bargaining will divide faculty and administration into labor-management factions and eliminate shared authority as it now exists.

5. It is supported only by dissatisfied lower ranks and the unproductive.

6. Too much power would be lost to arbitrators, especially in the area of tenure and academic freedom.

"In short, opponents of collective bargaining in higher education see the process itself as alien to the academic community, a threat to professional standards of merit, a conflict-producing force which will exacerbate the polarization of faculty and administration, and inimical to the best interests of faculty, students, and administration in the conduct of the educational enterprise."[16]

Today the primary representation of professional staff for collective bargaining in higher education is shared by three organizations or their affiliates: the American Federation of Teachers (AFT), the National Education Association (NEA) and the American Association of University Professors (AAUP).

The AFT is affiliated with the AFL-CIO and is considered the most militant of the three organizations. Since its inception, its primary objective has been collective bargaining, and as a result, membership has been drawn exclusively from the ranks of teachers/faculty, as opposed to including administrators. Attempted mergers with the NEA have failed primarily because of the AFT's alleged "excessive" militancy and its AFL-CIO affiliation.

The NEA was established as a multipurpose professional organization, with collective bargaining being only a recent area of interest. Membership is made up of faculty as well as administrators. But since undertaking collective bargaining, the association's appeal to administrators has declined. At the present time, possibly as a result of its identification as a professional organization, the NEA represents the greatest number of institutions.

The last of the major representatives is the AAUP. This organization functions only in the field of higher education and is considered to carry more prestige than the AFT or NEA, both of whom draw the majority of their members from secondary education. The AAUP has shifted its method of interaction with institutions from institutional censure to a more active role in collective bargaining.

There are a few independent organizations that represent higher education professional staff in collective bargaining activities. In Texas the major such organization is the Texas Association of College Teachers (TACT), which has recently developed a working relationship with the AAUP. To date, TACT has confined its activities primarily to lobbying with the state legislature. The TACT/AAUP group also has a cooperative relationship with the junior college association.

As a result of the growth of collective bargaining in higher education, several major problem areas have developed and come into conflict with the traditional personnel relationships. The scope of negotiations, as prescribed by the NLRB and most state-negotiating statutes, generally covers only wages, hours and conditions of employment. The extent of negotiations under the "conditions of employment" has seen a developing trend to broaden this term in higher education to include areas of tenure, academic freedom, faculty governance and formal grievance procedures. These areas of shared authority find little precedence in the industrial sector (other than grievance procedures), and even though they conflict with the "normal" management rights, faculties have fought to maintain their participation in these areas. Unions appear to be most effective in those areas which protect the rights of established faculty organizations, such as faculty senates and tenure committees, rather than attempting to replace them. In the area of grievance procedures, conflicts have arisen due to a fear of the grievance procedures being extended to policies of tenure and governance (scope) and the existence of possibly binding arbitration. Opponents of formal grievance procedures fear the decision of an "unqualified" arbitrator. Thus, in some instances, the arbitrator's authority has been limited strictly to evaluating procedural violations rather than actual policies.[17] In the public sector the scope of bargaining may be limited by prohibiting negotiations in certain areas by individual state statutes. In some states, for example, specific items such as salary or tenure procedures may be exempt from bargaining.[18]

Probably the most complicated and difficult problems have developed in determining the appropriate bargaining units for faculty members. This area also has seen the greatest number of court decisions in attempts to solve this problem. In the C.W. Post case of 1971,[19] the NLRB ruled against the claim that all faculty members should be excluded from the bargaining unit since they are supervisory personnel who participate in the decision-making processes of the university. However, until recently, both in the public and private sector, rulings generally have held that all faculty are not management. But a recent decision of the U.S. Supreme Court involving the faculty of Yeshiva University overturned an NLRB ruling and found that the faculty was management and hence not entitled to the protection of the NLRB. Since the faculty were declared to be supervisors, the university was not obligated to bargain collectively with the organization that represented the faculty. This finding was based on the extent of faculty authority dealing with academic matters and institutional policy. The overall implications of this five-to-four decision are unknown at this time, but it is sure to spur numerous appeals of previous NLRB rulings. The key to this and future rulings appears to be the "level of faculty participation," which further removes the possibility of using general guidelines and precedents in determining faculty bargaining units.[20] In the interim many private universities and colleges are refusing to bargain with the union representing their faculty once the existing contract has been terminated.

There also exist numerous contradictions concerning the inclusion of a department chairman in the bargaining unit. In general, the NLRB has ruled that department chairpersons do not function as a foreman or supervisor, as defined by the law. This decision was upheld in the Rosary Hill College[21] decision, and it appears that department chairpersons will be considered employees unless extensive evidence shows actual supervisory responsibilities.

In reversing a previous decision, the NLRB ruled in the NYU[22] decision that part-time faculty members should be excluded from the bargaining unit because they lacked a community of interest with full-time employees.

In determining if bargaining units should extend to campus-wide or even system-wide units, the NLRB has applied the test of "sufficient community of interest," and this has resulted in numerous variations. The trend is for public institutions to utilize system-wide units and private institutions to utilize campus-wide units, although separate units for medical, law and even pharmaceutical school faculties have been approved in certain cases. One reason for the move by engineering faculties for separate professional schools of engineering is to make it easier to establish a separate identity from the rest of a university's faculty and thus stave off unionization in the event the rest of the faculty were to vote for collective bargaining. Historically, the engineering faculties have been outvoted by their fellow faculty members and unwillingly have ended up being a part of the bargaining unit. With the establishment of the professional schools of engineering, the engineering faculties would have the opportunity of a separate vote on a possible collective bargaining representative.

The inconsistent rulings that govern public higher education collective bargaining are a result of the dissimilarities of the various colleges and universities and the numerous public sector statutes that govern them. Although state statutes and rulings tend to follow guidelines of the NLRB, the individuality of the institutions makes universal precedents virtually impossible. This inability to establish consistent and universal precedents continues to require individual rulings to accommodate the individuality that exists in the organization and operation of our colleges and universities.

Attempts have been made to bring about federally mandated public sector labor relations, which would eliminate the diversities in the various states, as well as require collective bargaining in such states as Texas. Congress has considered several such proposals. One would amend the National Labor Relations Act as amended (the Act) to include all public sector employees (other than federal) under the jurisdiction of the Act. Yet another proposed law would establish a separate system of allowing and regulating public sector collective bargaining. The potential legality of these two proposed laws, should either be enacted into law, came under serious doubt as a result of National League of Cities v. Usery[23] in 1976. In this case the U.S. Supreme Court, in a five-to-four decision, held that insofar as the 1974 amendment to the Fair Labor Standards Act, which extended the minimum-wage and maximum-hours provision to almost all public sector employees (except federal), the amendment was not within the authority granted Congress by the Constitution under the commerce clause. It was felt that the same reasoning of National League of Cities would make a federal public sector law also unconstitutional.

Since 1976, the NEA has supported in Congress a public sector collective bargaining bill which it felt would meet the requirements of the Supreme Court decision in National League of Cities. The proposed bill would amend the NLRA to include public sector employees under a somewhat local option provision.

A footnote in National League of Cities decision indicated that in making its decision the Court expressed no view as to whether a different decision might have resulted had Congress relied on other sections of the Constitution, such as the Spending Power provision in Article I, Section 8 (I) or Section 5 of the Fourteenth Amendment, empowering Congress to use legislation to enforce the due process and equal protection provisions of the amendment. Of these two, the Spending Power provision probably would be utilized first, primarily since there is strong precedence for its use in Section 13 (C) of the Urban Mass Transportation Act of 1964 as amended.[24] It requires that local collective bargaining and the rights and benefits of transit workers be preserved.

In addition, the Department of Education recently has been given Cabinet-level status. The NEA has been supporting such action for some time. It could be fully anticipated that this new federal department will be subjected to considerable pressure to tie its allocation of monies in education to the furtherance of collective bargaining in all educational areas.

Another recent development that will have considerable impact on collective bargaining in the states' public sector is the Civil Service Reform Act of 1978[25] (CSRA), wherein Title 7 codified collective bargaining in the federal sector. Collective bargaining in the public sector, including higher education, was relatively unknown prior to Presidential Executive Order 10988 in 1962, which initially brought collective bargaining to nearly all federal employees. As in many other fields, the federal government generally has initiated many changes in labor relations which the states subsequently have followed. The CSRA brought to the federal sector a collective bargaining system which greatly parallels the private sector system under the NLRA, with exception of certain union security measures, negotiations over wages and the right to strike. One of the strong points of the CSRA is its dedication to a grievance procedure (due process) that incorporates the use of binding arbitration as one of the possible final steps in the grievance procedures.

A Look into the Future for Texas

Collective bargaining in private colleges and universities in Texas is governed by the NLRA and the recent Yeshiva decision. The public sector colleges and universities are governed by V.A.C.S. 5154c. There is nothing in this statute that could be considered enabling legislation which would require or allow collective bargaining. However, Morris has proposed a system where the terms of a collective bargaining contract are placed in a members-only agreement enforceable under the individual contract of employment.[26] This system, according to Morris, would meet the requirements of Article 5154c. Morris' theory has not been tested to date.

There are conditions that could bring about collective bargaining. As pointed out earlier, two-year colleges have the greatest potential of

unionization. This is primarily due to two conditions: first, the colleges' personnel policies or lack thereof, and second, the political atmosphere in which they might be situated. In spite of Article 5154c, many cities and other public entities bargain collectively with unions. There may or may not be a formal contract signed between the parties. The single characteristic that brings about this act of bargaining is the union's political power in a specific locale, Pasadena being a good example. Some of the two-year colleges may find it politically advantageous to bargain with their teachers' union.

The four-year institutions can be categorized into three types: the teaching-oriented institutions, the combination research and teaching institutions and the urban institutions (whatever their classification with regard to teaching and/or research). The urban institutions are placed in a separate category, as they will receive considerable pressure along with two-year colleges for some type of union recognition if they are in a locale with a strong union political base. As money for higher education becomes more difficult to obtain, urban institutions can expect to have more and more pressure applied by their local labor-oriented legislators to engage in some type of collective bargaining in exchange for legislative financial support.

The faculties of the four-year teaching-oriented institutions have been more active in various forms of collective bargaining than those of research and teaching institutions. This can be seen from the TACT Bulletins that list the number of TACT members on each four-year public institution campus.

The higher education organizations themselves do not have the political power to achieve the passage of collective bargaining legislation. But when they are combined with other teacher groups (K-12)--such as the Texas State Teachers Association (NEA), public sector unions, AFT affiliates and the Texas AFL-CIO--a large block of political power can be brought to bear on the state legislature for the passage of the desired enabling legislation. The union political power in Texas is growing.

The last category of four-year institutions is the research and teaching-oriented university. In the past, the faculties of these institutions, in general, have not been too supportive of collective bargaining, but changes are developing that may alter this attitude. The primary reasons for this change are enrollment growth and salaries. This is not to say that enrollments and salaries are not problems at all colleges and universities, but a special set of circumstances is now beginning to appear at the teaching and research schools, particularly in those disciplines heavily involved in research. The salaries and numbers of faculty members are not keeping pace with increases in enrollment and monetary inflation. It is now possible for faculty members in these areas to obtain jobs in other universities with 25 to 40 percent pay increases. Also, these other universities are encouraging their faculties to become more involved in consulting as a public service. These same academic areas referenced above also are attractive to industry to such a degree that it is possible for a faculty member to increase his pay some 30 to 100 percent by accepting a job in industry. The starting industrial pay for some new doctoral recipients is nearly $40,000 per year plus an additional 40 percent in fringe benefits.

The loss of faculty members due to the salary differential places more and more demands on the remaining faculty. As a result, the remaining faculty

can very well look to institutions external to the universities for relief, namely unionization.

Some studies argue that low salaries are not a direct inducement to unionization; instead, the most important single cause is a threat to the guarantees of due process that comes with tenure. Others have argued that the possibility of retrenchment is a source of union support. Yet others feel that the increase in size of the institution, followed by a depersonalization of the individual, is a major cause.

In spite of all the arguments, if faculty members find it difficult to meet the pressures of their family financial obligations and do not move to other jobs, they will turn to unions for help, as has occurred in the teaching and two-year institutions.

The prospect for additional unionization in Texas higher education is more favorable in the 1980s than in the 1970s. In those geographical areas where the unions have sufficient political power, the colleges and universities will come under considerable pressure to bargain in some fashion with their faculties, in spite of Article 5154c. There is a good possibility that the new Department of Education will use its Spending Power to encourage collective bargaining, regardless of state law. There will be increased pressure from the federal government directly and indirectly to either change Article 5154c or else usurp it. At the same time, there will be pressure from the faculty members themselves, primarily due to low salaries, lack of due process and increased academic responsibilities, which could move higher education more in the direction of unionization. However, in Texas greater attention to these perceived faculty needs will greatly slow the spread of unionization. Any large scale move in that direction must be preceded by the federal government's passing a public sector collective bargaining law or the State of Texas' modifying Article 5154c.

NOTES

[1] M. J. Fox, Jr., and J. F. Reed. "The Law and Texas Teacher's Unions," Journal of Collective Negotiations, Vol. 1(3), p. 264, August 1972.

[2] Cornell University, 183 NLRB 329 (1970).

[3] T. H. Ferguson, W. L. Bergan and J. L. Braff. "Labor Board Jurisdiction and Unit Determination" in Collective Bargaining in Higher Education--The Developing Law, ed. J. P. Vladeck and S. C. Vladeck, Practicing Law Institute, New York, 1975, p. 171.

[4] J. Garbarino. Creeping Unionism and the Faculty Labor Market, in Gordon (ed.), Higher Education and the Labor Market, McGraw Hill Book Co., New York, 1973, p. 4.

[5] R. E. Cleveland and M. J. Fox, Jr. "The Community College: Standard Bearer for Collective Bargaining." Journal of Collective Negotiations, Vol. 5(1), 1976, p. 67.

[6]D. Newton. "Faculty Attitudes and Collective Bargaining in Higher Education" in Collective Bargaining in Higher Education--The Developing Law, ed. J. P. Vladeck and S. C. Vladeck, Practicing Law Institute, New York, 1975, p. 103.

[7]B. Zeller, "Why Faculties Organize" in Collective Bargaining in Higher Education--The Developing Law, ed. J. P. Vladeck and S. C. Vladeck, Practicing Law Institute, New York, 1975, pp. 82-85.

[8]Newton, p. 113.

[9]Zeller, p. 85.

[10]Cleveland, p. 75.

[11]Zeller, p. 87.

[12]J. L. Marshall. "The Effects of Collective Bargaining on Faculty Salaries in Higher Education." Journal of Higher Education, Vol. 50(5), May 1979, p. 318.

[13]J. W. Garbarino. "Faculty Union Activity in Higher Education." Professional Engineer, Vol. 49(6), June 1979, p. 24.

[14]Newton, pp. 108-112.

[15]Barbarino, p. 24.

[16]Newton, p. 108.

[17]W. F. McHugh. "Tenure and Collective Bargaining," in Collective Bargaining in Higher Education--The Developing Law, ed. J. P. Vladeck and S. C. Vladeck, Practicing Law Institute, New York, 1975, p. 75.

[18]C. J. Naples and J. M. Bress. "Collective Bargaining its Scope," in Collective Bargaining in Higher Education--The Developing Law, ed. J. P. Vladeck and S. C. Vladeck, Practicing Law Institute, New York, 1975, p. 224.

[19]C. W. Post Center of Long Island University, 189 NLRB 904 (1971).

[20]B. T. Watkins, "High Court Calls Yeshiva Faculty Managers," Chronicle of Higher Education, 25 February 1980, Sec. 1, p. 1.

[21]Rosary Hill College, 202 NLRB No. 165 (1973).

[22]New York University, 205 NLRB No. 16 (1973).

[23]The National League of Cities et al. v. W. J. Usery, Jr., U.S. Supreme Court No. 74-878, June 24, 1976.

[24]Urban Mass Transportation Act of 1964 as Amended, 49 U.S.C.A., Section 1609, 1971.

[25]P. L. 95-454, 92 Stat. 1111, 5 USC 1101.

[26]C. J. Morris. "Everything You Always Wanted to Know About Public Employee Bargaining in Texas--But Were Afraid to Ask," 13 Houston Law Review 291, (January 1976).

STATE SUPPORT OF HIGHER EDUCATION

by John Harris

Why Clear Goals Now?

As political leaders, state planners and educators face the 1980s, purposes of higher education stated and actual, will be critical. Questions about role and purpose are not raised so persistently when an industry is growing as when its growth is markedly slowing or particularly when it faces no growth or a decline. Hard choices are often avoided in growth because weaknesses and inefficiencies can be covered through growth margins.

Not only will purposes be reexamined within higher education, but priorities for all state or public expenditures will be reassessed. "What in the state budget market basket can we most afford to do without or to have less of?" Higher education not only competes with elementary and secondary education for tax dollars but also with corrections, health care, welfare, roads, the judiciary, recreation, etc. With an aging population, health programs as well as many other programs will require more funds, and the votes will be there to support them. Increased competition for funds in a period of generally slackening revenues will bring persistent questions about higher education budgets, hence its contributions.

Beyond competition for dollars in hard times, there is another pressure to clarify purposes--accountability. In the private sector, the tradition has been that a free market disciplines businesses and industries. Those making money survive; those that don't change or die. Theoretically, no attempt is made to judge the business' social worth, except in the most extreme and obvious cases, in terms of ideals or values. Hence there is no complex review against written criteria by committees; there is only survival. For all the problems of reinforced-ruthlessness and anything-to-make-a-buck, such a system is disciplined against the reality of survival and so constantly adjusts itself to socioeconomic changes.

Publicly supported enterprises--welfare, education, defense, prisons, roads, etc.--are not subject to such discipline. Rather they are established to provide services from granted funds. As bureaucracies, they provide services to one set of people while getting the money to do so from another. Even if their clients paid directly for their services, these bureaucracies have no competitors among whom clients may shop. The result is almost always cost increases greater than increases in quality or quantity of services.

Nevertheless, federal and state governments are struggling to make bureaucracies more cost effective. The first thrust in this regard is to determine if they are doing what they were established and funded to do. This inevitably calls for the stating of performance and product objectives. A state agency then is expected to define itself in terms of its results rather than its processes. Modern budgeteers and planners see the "best of worlds" as when budgets are directly linked with outcome objectives. So, a bureau or agency is judged by what it <u>accomplishes</u> rather than what it <u>is</u>. Therefore, its processes may be lean but effective.

The emphasis on outcomes implies the means have no value except as they contribute to the outcomes. In fact, the administrator is accountable against the min-max criterion: Minimization of costs and maximization of the results. (Commonly known as, "The biggest bang for the buck.")

Their way of thinking is not isolated to a peculiar or small group of public policy theoreticians or practitioners. It is a widely held view sustained by popularized-pragmatism, "If it works it's OK." No institution in contemporary America can long escape being judged by the efficiency with which it accomplishes its objectives.

In terms of funding, public higher education is often considered another agency of the state. Its goals, therefore, will have to be very clearly stated for two reasons:

1. For the state to decide on the relative social and economic value of higher education as compared to care of the aged, corrections, mental health, etc.

2. To be accountable for its purposes. The two major accountability judgments to be made are as follow:

   a. Are its stated purposes and operations consistent?

   b. Are its operations cost effective in terms of results?

Questionable Assumptions

Behind this way of thinking are assumptions which both idealists and realists question. First, does the state through its legislative and executive functions rationally decide to change the relative funding of any state agency or institution in terms of clearly stated goals weighed against perceived social values and needs? A more realistic understanding in increasing or decreasing a particular state budget is that it is due to the cumulative political pressure to do so. Goals, therefore, function more as describing paths already taken because they accommodate the most people through channels of less resistance. Therefore, the best effort of such a paper as this is to attempt to make explicit the current and anticipated social functions of higher education rather than trying to divine ideal goals.

Second, the concept of clarifying purposes in order to find the most effective and efficient means of accomplishing them, if taken to the extreme, has some extraordinary and unlikely possibilities. One such possibility is that the state is free to arrange to meet any clear and pressing need in any effective and efficient manner. For example, the assumption goes something as follows: If drivers' licenses could be more efficiently processed under contract to a private corporation, then the relevant state bureau would be dismantled and a contract let to the lowest bidder.

The point is a thoroughgoing commitment to maximizing results means abandoning a permanent commitment not only to any fixed ways and means but also to any given institution. It means choosing means strictly in terms of their effect and relative costs. If this is taken seriously in state support of higher education, several dramatic implications follow.

1. It suggests purposes of higher education can be so clearly articulated as to provide the basis for developing bid specifications for contracts.

2. The state through its delegated authority is capable not only of articulating such goals but also of determining if the contract is being kept.

3. Finally, the state is free to exchange vendors if the contract is not being honored and free to intervene periodically to adjust contracts.

Given the perspective outlined above and since higher education was primarily in private hands up through the late 1800s, one might question why states elected to build their own institutions rather than contracting with private ones for the delivery of very specific services. Trying to account for this development would be a massive study in and of itself. The fact is states opted to establish colleges and universities in roughly the mode of the existing private and religious institutions. Such institutions were established as somewhat autonomous and self-regulating institutions with:

1. Separate governing boards of trust.

2. Executive officers serving at the pleasure of the board, not directly responsible to the primary fiscal sponsors--church, philanthropists, etc.

3. Pluralism of internal governance designed for self-regulation.

So, by opting first to establish its own colleges and universities and second to use the same institutional mold as the private institution, the states committed themselves to a massive undertaking over which they could have little direct control. By so deciding, the states restricted themselves from:

1. Changing vendors of services.

2. Directly intervening in the institutions' operations for any reason.

Since World War II, American higher education has grown incredibly as an unquestioned good. It rode the crest of America's great gains in material affluence and world leadership. There was a steady stream of students: veterans (World War II and Korean), veterans' children and the federal subsidization of the disadvantaged. Community colleges appeared everywhere; many completely new universities were established. Almost all the old as well as the new ones grew rapidly.

Each new institution either began or quickly became more alike rather than distinct from previously established ones. So we now have a very massive set of similar institutions in place with great expectations and needs for funds growing faster than their productivity or quality improvement. The dilemma for legislators, state budgetmakers and state executives is what began as an adorable baby has become an awkward teenager with growing demands for money and freedom and little acceptance of direction.

Institutions were often built by political demand rather than needs being clearly identified and then searching for the most effective and least costly way of meeting them. Every city or region wanted its share--a college or university. The local delegations which campaigned for their colleges usually had different sets of expectations for the institutions than did the young PhDs recruited to them straight from distinguished graduate schools. Under the inherited shelter of autonomy and the non-authoritarian, pluralistic internal collegiate governance structure, these new institutions, despite early expectations, have come to function primarily as their faculties would have them function. Further complicating the relating of these institutions to local community needs and wishes are centralized governing bodies and funding patterns typical of most states. The institutions are somewhat insulated from local concerns not only through the conventions of the academy per se but also through the relatively remote centralized governing boards.

All of this is to say that the inclination to make higher education as effective and efficient as possible runs against several grains. It presupposes higher education purposes can be articulated separately from its processes. Furthermore, it presupposes the state through some means outside the academy can decide to either change vendors or directly cause the academic establishment to change its ways.

Since higher education is not a part of the free enterprise system, it is not disciplined by a free market. While it is funded by the state as if it were an agency of the state, the state does not have as direct control over it as it does a typical agency. The state is greatly restricted in how it can alter higher education's basic patterns of operation. To a great extent, the state can decide to establish and fund a college or university; but it cannot run one directly.

Productive Discussion

Since there are fundamental structural problems in the state's directly managing higher education in terms of clear performance and product objective, what purposes can any clarification of goals serve? While by its nature and history higher education is not susceptible to direct, external management, it is greatly influenced by the social and economic goals of its host society. If it can be agreed the era of sheer growth is essentially over and a period of consolidation is beginning for American higher education, the state and the academy as interdependent bodies need a frame of reference through which their respective concerns can best be communicated. A helpful frame of reference should include the following:

1. A perspective on the history of state support for higher education.

2. A broad outline of purposes the state and its institutions might mutually accept.

The State and the Academy

From the founding of Harvard to the most recently established community college, American higher education in the main has made the following shifts:

1. From God to humanistic man to economic man.

2. From sponsorship by the church to private, non-religious philanthropy to the state (federal government included).

The Civil War was a watershed for many of this country's social institutions, and higher education is no exception. Early American colleges tended to concentrate on religious and classical studies. Instruction in pure science was limited and applied science and technology almost nonexistent. Business and industrial skills were learned outside the university by apprenticeship, through the family business or through the school-of-hard-knocks.

The society opened up in many ways after the Civil War, particularly through industrialization and Western expansion. The Morrill Act establishing land grant colleges and the new directions begun at such institutions as Cornell marked the growing alliance among the academy, the state and industry. While a primary function of the colonial college was to supply an educated ministry, increasingly higher education was to supply trained manpower for commerce and industry. This obviously provided many poor young people a chance to step out of their parents' caste onto the economic escalator of university training and credentialling.

As the West filled up, education became the primary way most young people could by their own efforts improve their circumstances. A growing post-World War II economy could absorb readily college graduates without too much regard for a direct match between specific preparation and specific entry jobs. Social and political commitment to equality through equal educational opportunity probably reached its apex in the Great Society's programs.

Equal and vastly increased educational opportunity programs appeared to many to be a very "socialistic" policy. Actually, it may be understood as a way to maintain individual freedom and private property rights while avoiding the alternative of dictatorial intervention of government in direct redistribution of wealth.

Furthermore, to the extent the United States was passing from an industrial/manufacturing to a technological society, human capital became more important in distinguishing the relative assets of nations. So, more education for more people was not only a response to egalitarian pressure but also to regional and even national economic aspirations. One suspects the framers of such policies were willing to accept some decline of academic quality in the short run if in the long term there was reasonable hope of:

1. Satisfying rising expectations of minorities and the poor in general without fundamental change of the social fabric and economic order.

2. Aggregate increase in national and regional human resources.

Needless to say, the shiny new optimism about the almost utopian results to follow greater investment in higher education has changed in some quarters to lingering skepticism.

1. A college degree in and of itself is no longer a guarantee of a good job with an expanding career future.

2. The income differential between college graduates and non-graduates is not now so uniformly great.

3. The prestige value of any commodity is obviously related to the proportion of people who have it--a college degree is not the rarity it was.

4. Finally, American higher education admitted a broad spectrum of students without restructuring its basic processes. That is, with the lowering of admission standards there was no compensating establishiment of explicit, minimal exit or graduation standards.

The American academy and its primary sponsors are searching for a clear driving purpose. Very little of American education has the purpose of learning God's will. While the humanistic, learning-for-its-own-sake rationale is now often spoken, it does not appear to be a significant mover of students or dollars. While still quite strong, egalitarian rationales for higher education do not seem to have the punch they once did.

Perhaps we are in a period without ties that bind us to any strong social commitments which higher education could serve. That is, at the very time higher education needs the clearest possible definition of its role, the general society may be least able to provide it with a driving and sustaining role.

At first, this is disquieting to American higher educators. They are so accustomed to making public higher education's case as a direct expediter of some immediate national or regional agenda: catching up with the Russians after Sputnik, making the Great Society or attracting industry. But the lack of a crash program objective could be an opportunity for maturing. Perhaps more limited, consistent and long-term goals may emerge. The remainder of this paper will attempt to outline what broad purposes American, state-supported higher education may continue to serve.

Limited Purposes

What basic and continuing needs of the American socioeconomic order will higher education most likely be expected to help meet? What can American colleges and universities do to meet these needs that are consistent with their current evolved structures and procedures and typical personnel? Obviously, somewhere at the intersection of these questions lies the critical functions of higher education.

Training and Credentialling

If one were betting on which colleges and universities will continue to attract students, surely the odds would favor those yielding graduates with professional and technological competencies. This includes not only institutions directly offering advanced professional and technological degrees but also undergraduate institutions with good records of getting their graduates into post-baccalaureate professional or technological schools.

This is no recent expectation of higher education; it has probably been the driving purpose since their medieval origins. It is a common expectation not only across the centuries but also across economic orders. Whether capitalistic or communistic, Western or Eastern, secular or religious in emphasis, societies and groups inevitably create places for their most talented to

learn to provide vitally needed, high-level services. It is difficult if not impossible to conceive how advanced social and economic orders, much less technological ones, could exist without an institutionalized means of:

1. Identifying the rare resource of talent.

2. Educating or training beyond the instructional capabilities of the primary family.

3. Credentialling such talented and trained persons for wide acceptability and employment.

Professional and technological education is often criticized: "It's too expensive." "There are not enough spaces." "It's elitist." "There is too much of that and too little of this." The typical criticisms are not fundamental or basic; rather, they suggest the general public wants more and better.

In considering the state's investment in higher education for the last two decades of the 20th century, there are two major questions:

1. What mixes of professional and technological pre-service programs are most needed, and how can they be financed?

2. To what extent will the universities be involved directly and formally in providing in-service, continuing education?

There are many arguments against making professional and technological education the umbrella purpose of higher education. One argument is that much education tends to be high-level training in the known and does not contribute to the expansion of knowledge. Hence it is basically parasitic. Another concern is that it trains students to fit into society rather than helping them gain perspective on the condition and nature of man and the peculiar and universal characteristics of the student's culture. In brief, such education does not have the freeing effect ideally attributed to liberal education.

Nevertheless, this writer believes if higher education began casting off many of its current functions the largest outcry would come if it attempted to divest itself of professional and technological education. Not only does this function have relatively widespread support among the most influential strata of society, it is also a role quite consistent with the history of universities. The professoriate is using its scholarship to help society through educating high-level practitioners. What began in the 1800s as the reluctant acceptance of professional, "practical," "vocational," education into the American academy has become its primary function.

To make this somewhat more concrete, one need only reflect on the primary rationale to justify establishing new degree programs. When institutions propose to govern or coordinate boards in establishing new degree programs, and when board staffs review such proposals, great attention is given to demonstrating "need" for the proposed program. The primary way of demonstrating need is to display somehow the number of jobs available for graduates. It is difficult to imagine need justification being expressed in terms such as:

1. To understand the nature of things.

2. To know the will of God.

3. To enjoy the delights of the mind.

Other Purposes

Higher education has many other espoused purposes and many socioeconomic functions other than training and credentialling professionals and technologists. But these other purposes tend to reflect either the priorities of the academy or its sponsors.

The thesis in training and credentialling is the one major role which best reflects the interests of the broad society and the capability of the academy. In a country noted for its material abundance and progress, social distinction based on one's work and achievement rather than lineage and separation of church and state, what other consensus emphasis could state-supported higher education have?

There are other functions of higher education which are significant without having the wide consensus support of training and credentialling professional and technological manpower. There are other purposes which primarily play supporting roles.

Literacy and Numeracy. By literacy and numeracy in higher education is meant the ability to read, write and compute at levels necessary for professional and technological work. On the other hand, a major issue of public policy in state-supported higher education is how much should colleges and universities attempt to remediate students in elementary reading, writing and arithmetic. A functional distinction between elementary and secondary education and higher education in terms of literacy and numeracy would be helpful in determining institutional responsibility. The point is if students cannot read a typical article in a local newspaper or reliably perform the four basic operations of arithmetic, should a college or university attempt to remediate them? On the other hand, educating students to read, communicate and compute at an advanced level for professional and technological work is commensurate with what has been suggested as the primary function of American higher education. The point is colleges and universities ought to be distinct functionally from elementary and secondary education at the level in which they instruct in literacy and numeracy.

General Education. Beyond high-level skills of reading, communicating and computing, a university or college education has generally suggested possession of a general fund of knowledge and some skill in knowing how and where to obtain facts. The immense problem in this regard is how a faculty or any group decides what general knowledge to require of all degree candidates. There is much that is not only nice but important to know compared to the typical human capacity and time to learn. From what visions do we determine what the university-educated man or woman ought to know as the 21st century approaches? General education requirements in most colleges and universities result from political compromises. Most academic departments within institutions would like to make their respective specialties absolute requirements for all degrees.

There are two basic problems in general education. First, there is very little general education left in most institutions as professional and technological specialization has become so dominant. Second, the lack of any transcendent vision within the society means there is no overweening view to sustain any particular general education plan. There is now no ready answer for why sophomore English literature is a more common degree requirement than basic nutrition, general economics or physical science.

Herein lies one of the fundamental difficulties of American public higher education. The American culture remains a distinctly varied patchwork of ethnic, economic, religious and even regional sub-cultures. We may gain our livelihoods through a common economic pot, but we have not melted away our cultural differences and do not appear inclined to do so. For example, a Jew, an evangelical Christian and an atheist may work reasonably well together as fellow engineers. But to the extent they relate their philosophical and religious presuppositions to what they would have their children know and understand, they cannot agree on a common general education. So to educate the children of all three, it is difficult for state institutions to define general education beyond the higher literacy and numeracy skills. What people of different philosophies, religions or races can have in common about education is to gain an earning skill from it. In that the primary thrust of state-supported higher education began with an alliance with industry and agriculture, what is common or general in it is the reason most people pursue it--economic betterment. To educate effectively persons in common beyond high communication and computational skills conflicts with the distinct values of our various peoples. One man's philosophical or religious enlightenment is another's apostasy, propaganda or superstition.

Even faculty in professional schools often believe there ought to be some component of general education in all degree programs. Obviously, the faculties of arts and sciences generally believe this. Nevertheless, the professional and technological programs persistently press for more of the student's time to the diminishment of general education requirements. Significantly, general education courses are frequently referred to as "service" courses. The implication is clear; their justification lies in what they contribute to making an engineer, school teacher or nurse.

Personal Development. Some would make the direct goal of education personal integration--the development of the whole person. It is difficult at best to square all that is implied by such an emphasis on personal development (emotional adjustment, values clarification, character development, etc.) with the basic nature of the academy, the preparation of typical academicians and the people's major expectations of higher education. Nevertheless, the greatest difficulty lies in how an institution of higher education can concentrate on matters of values and character for a society as diverse in its values, behavior norms and views of the nature of man. In brief, personal development as a primary and direct agenda of state-supported higher education has the same basic difficulty as general education in so diverse a culture.

Scholarship and Research. There probably is no discussion more likely to evoke sharp and persistent differences between the academy and the state than one on scholarship and research in state-supported institutions. It

may be the differences are greater in theory than in actual practice. In the abstract, scholarship and research conjures images of the reclusive academician lost in his own strange pursuits neglecting eager sophomores. In reality, most university constituents are proud of the agriculturalist who develops heartier, less-expensive forage. There is, therefore, a feeling within the academy, "If they just knew what we were actually doing, they--legislators, parents, citizens, etc.--wouldn't be so critical."

It may be at this point, when a state decides to establish or maintain a university, that there is an inevitable endorsement and support of research. The basic rationale for research relates to training and credentialling professional and technological people. At the level of university training, it is difficult to conceive of maintaining competent and current faculties if they only teach what they were taught. In the main, one doubts there is much dissent with scholarship and research which directly strengthens professional and technological education. Up to a point, sponsors of universities have little choice but to support generally scholarship and research generated by faculty in professional and technological education. On the other hand, the state eventually controls the amount and type of research and scholarship it supports when choices are made regarding what degrees various institutions will be allowed to offer.

At the same time, the academy is vulnerable in its overemphasis on evidences (publications usually) of research and scholarship in all types and levels of higher education regardless of the particular missions of different institutions. This emphasis has spawned such a proliferation of academic publication that much of it appears to many to be "much ado about nothing." Nevertheless, the "much ado" has large real costs.

The problem seems to lie in the inability or reluctance of institutions and governing boards to operationalize distinct institutional missions. That is, when one institution is designated a research university and another to emphasize instruction, it is difficult to distinguish the two institutions in terms of such operational matters as criteria and procedures for evaluating faculty. It might be assumed if the distinct missions are not being operationalized accordingly, then a modern-day Procrustean bed must be employed. If reality will not fit theory conveniently, then force the theoretical mold.

It is not appropriate in this paper to pursue the issue of statewide governance designed to facilitate diverse and complementary missions among state institutions. Yet the fact remains that four-year institutions appear to be more alike than different despite considerable effort to the contrary. Perhaps the evidence suggests the theory of diverse and complementary institutions is wrong rather than assuming operational behaviors of institutions are inconsistent with the espoused theory.

The only functional discriminant in research that is encouraged is publication. If it is published and particularly if it leads to funded research projects, research is recognized through faculty rewards. Faculty members will spend great time and effort on those matters which most directly affect their status and purse. Consequently, the public has some basic concern that teaching and advising are not of first importance to faculty. Somehow we must reconcile the stated and actual missions of institutions in regard to teaching and research. Research will probably be encouraged

as it serves to maintain respected professional and technological education.

Public Service. Legislators and state budget-makers are leery of the claim, "The public demands this or that." The suspicion grounded all too often in experience is that the agency proposing to deliver a given service is more interested in delivering it than the public is in receiving it. Consequently, higher education's gracious offer to provide off-campus credit and non-credit courses and various forms of technical assistance is, to say the least, not being greeted enthusiastically. Does this amount to institutional life saving? Given the declining number of 18- to 24-year-olds in the 1980s, is all the talk and to-do about outreach the creation of a new market to make up for the declining one?

To set this issue in perspective, there are several things which appear to be relatively certain.

1. The 18- to 24-year population will decline at least into the early 1990s.

2. Unless a larger number of older people and a higher proportion of high school graduates enroll in higher education, the number of college and university students will decline in the 1980s.

3. As people change careers and particularly as women re-enter the job market, some retraining appears to be needed.

4. As people attempt to remain competent and current in their vocations, education will probably have to be continuous rather than once for all.

5. The problems of private business and public agencies given their funding and personnel circumstances, appear to make it inevitable that temporary, job-specific experts be retrained. That is, permanent generalist staffs often are not able for a variety of reasons to address specific and irregular problems.

6. The land grant university has had a major impact on American agriculture through the interconnection of research, teaching and extension through demonstration, special instruction and advice on specific application.

The suspicion of higher education's motives for its interest in outreach is understandable. Nevertheless, surely we would hope the self-interest of the academy and the needs of the economic and social order will be congruent. When the society sought to help the disadvantaged while maintaining private property and individual freedoms, it turned to higher education. The key word in higher education during the Great Society thrust was "access." Before this and after Sputnik, the academy adapted to an emphasis on science and technology. Perhaps the genius of American higher education lies in its responsiveness to the needs of the society.

The real question is how much the economy and society need higher education outreach--continuing education and technical assistance. Large businesses and the professions themselves are already providing an immense array of continuing education sharply focused on their specific and immediate needs. As

for technical assistance, consulting is now a major industry in and of itself. Consulting firms may often be more specifically prepared to address certain problems. They may also be more responsive than universities, often encumbered by not only academic form but also by administrative bureaucratization now so pervasive in the academy.

Despite the problems, there are several advantages for involving colleges and universities in outreach service. First, to the extent institutions of higher education have difficulty in knowing and identifying with their primary constituencies, outreach can be a very effective bridge. No university with many faculty working on production line problems, water supplies, public education, etc., can remain an ivory tower enclave. Up to a point, it is reasonable to assume teaching will be enlivened by allusions to immediate problems.

While there are advantages for the academy beyond avoiding the difficulty of long-term shrinkage, there may also be advantages to communities and businesses in using the resources of higher education. Formal contractual agreements with colleges and universities theoretically should offer several advantages.

1. First, truth and quality should be particularly honored in the academy. Academic freedom should protect the professor delivering a contracted service as it protects him to follow the evidence in his instruction. The academy is expected to press its members to follow evidence over prejudice.

2. Because technical assistance is not the academy's primary function and means of support and because it is not in operation for a profit, the costs of technical assistance should be competitive with private vendors.

3. Finally, college and university faculty cannot go back to Washington or Chicago when the service is over as some consultant staffs. There is someone and an organization which is dependent on the long-term good will of its constituency to hold responsible.

So whether this economy is going to push on into the technological, post-industrial society or to reindustrialize or to do both, colleges and universities are likely to be involved as they have been in major socioeconomic agendas. The question is, "How?" Who will pay for the continuing education of professionals? Will continuing education not directly related to professional performance receive any public support? Who will pay for professors helping public schools with specific projects?

No one can answer these questions with certainty. Yet, if current patterns are any indication, one suspects the following:

1. Cost of non-credit instruction will be borne primarily by the students.

2. The proportion of the cost of credit instruction borne by the student will be increased for all students--18 to 24 years old as well as older students, on-campus as well as off.

3. Businesses and public agencies using the services of a state college or university, personnel as well as technical resources such as computers, will at least pay actual costs.

4. Possibly, the state will support a coordinating, linking function in public service administration within institutions to facilitate an account for outreach efforts.

Summary

The line of reasoning advanced in this paper is as follows:

1. There are two major reasons to re-examine the basic purposes of state-supported higher education:

   a. Competition for limited state funds, and

   b. Wide acceptance of the accountability frame of reference.

2. Higher education by nature of its historic structures cannot be made a direct agent of the state, but has proven, particularly in America, to be responsive to basic social and economic needs.

3. In the absence of common, transcendent ideals based on religion, political theory or social homogeneity, the common denominator is economic betterment. So, a diverse people can profit from, and in turn support state higher education primarily focused on professional and technological education.

4. Therefore, the center support for the higher education umbrella is professional and technological education and certification. The estimate is that this is the one function most citizens will pay for through taxes and tuition.

5. Why should the state subsidize such education? Earlier, it was suggested that in one respect this is now essentially a moot question. For a variety of reasons, states chose to build institutions rather than contracting with private ones to expand to provide professional and technological education as a contracted service. The state faces a dilemma in being responsible for so large an undertaking over which it can have so little direct, operational control. Nevertheless, as difficult as its dilemma, even more difficult would be an effort for the state to abandon these institutions.

6. The task, therefore, before spokesmen for the state and the academy is to clarify their expectations. In this paper, the attempt has been to make explicit what has been the growing implicit function of state-supported education: professional and technological vocational preparation and certification for a diverse people who despite their diversity can identify with and support education which respects their differences with the common feature of economic betterment.

Reflections

Reflecting on the thesis of this paper, two general questions linger. One has had to do with what proportion of the cost of professional and

technological education should the state pay compared with what the student pays. Related to this, of course, is what vocations or careers will be accepted as requiring distinct educational programs.

Coordinating boards will inevitably concentrate on reviewing degree programs related to professional and technological preparation. And the major policy questions will be on what programs to establish and eliminate and what proportion of the costs the state should bear. In terms of formal criteria or rationales, the trend seems to be focusing on the following:

1. Market analyses to determine what is "needed."

2. A steady press for students, as direct if not primary beneficiaries, to pay a larger proportion of the costs.

The second reflection is the realization that the major, common element in our society is not a commanding religion, a unifying political theory or a common racial ancestry. In the absence of these, it appears to be money. If it is money (and this writer believes it is), then we all had best learn something about money--how it works, how it's made and how it's used and misused. If theology is the common thread of general education for a religious culture and the classics for a humanistic one, economics is appropriate for a materialistic culture. For a general education program of study, economics will have to be as broad as the concerns of the society:

1. Equality versus difference.

2. Authority versus freedom.

3. Security versus incentive.

4. Group versus individual.

5. Homogeneity versus plurality.

6. Change versus continuity.

The basic, recurring issues of human existence come to light somewhat, regardless of the field of study. That is, serious studies of theology, classical literature or the current social sciences eventually address essentially the same basic issue. Nevertheless, the lens through which issues are viewed greatly determines the resolutions typically settled on for the era.

If we are going to view the human dilemma primarily through economics, however broadly defined, what answers will we tend to settle on? About one-half of the world has settled on Marxist answers. Idealistically, Western general education has not attempted to give answers but to frame problems, to suggest ways they have been and now might be explored and to respect different answers when there is integrity in the search. Obviously, this respect for different answers is a dogmatic value.

The mere title of B. F. Skinner's Beyond Freedom and Dignity suggests the whole idea of general education facilitating diverse ideas and courses of behavior is now questioned. Skinner assumes behavior as a response can be completely understood as adaptation to environment, stimuli. It is not necessary or useful to see anything inside man except an exquisitely elaborate

switching system. No more fundamental issues confront state-supported colleges and universities than those related to general education. Professional and technological programs of study are generally dictated by their respective national, professional organizations. From the perspective of professional education, general education is either diminished for more work in the major or by certain stipulated "service" courses. The hardest question is not just what should constitute a general or common education for a "free" and "diverse" people. The basic question is whether "freedom" and "diversity" are or ought to be respected.

The man who sincerely prays, "Thy kingdom come, Thy will be done on earth as it is in heaven," is clear about what should be common understandings, hence general education. The man who works for the supremacy of the proletariat has no doubt how he would shape (educate) people in common. But what general education results from a commitment to freedom and diversity? The commonality is "skepticism" about all ideologies, religious or secular, even skepticism about the values of "freedom" and "diversity."

If general education plays the skeptic's part, it has a purchase on the basic Western values of freedom and diversity. To the extent general education faculty become dogmatists, even for contrary opinions, they loosen that purchase. Worse yet is the adoption of pervasively cynical and nihilistic roles.

All of this suggests higher education, particularly of the state, should not attempt to become the secular church for its society, not in a free and diverse society. To use an old platitude, "It cannot be all things to all people." Other social institutions have powerful roles to play in affirmation. Higher education simply should not suggest it can prepare one for life if such suggestion implies "complete preparation."

INDEPENDENT HIGHER EDUCATION IN TEXAS--1980

by Charles H. Oestreich

Introduction

Opportunities for higher education in Texas are provided by two groups of colleges and universities, those financed and controlled directly by state government and those privately financed and governed. The great majority of the private institutions, serving all but three percent of the undergraduate students in the Texas independent sector, belong to the Independent Colleges and Universities of Texas, Inc. (ICUT). (See Appendix A.) Nonmembers are primarily special-purpose institutions, such as Bible colleges, health professions schools, law schools, seminaries or technical institutes. (See Appendix B.) Readily available data and information relate primarily to the 40 well-known, fully accredited ICUT colleges.

Taken together, these 40 independent colleges comprise a large, healthy component of the higher educational enterprise in Texas. They enroll about 74,000 students each year, employ over 3,500 full-time faculty members and expend over $350 million annually for general operations. In addition to operating expenses, expenditures for construction have been very large, particularly in the past decade.

Many independent colleges have construction and renovation projects underway at the present time. One independent college will have a large new library this year. Another will dedicate a new theater; one, a new gymnasium, while another has a recital hall under construction. Enthusiastic support from a church body and students demands an additional new dormitory at another college. All types of ICUT colleges--junior-senior, graduate-undergraduate, technical-general, black-white, Catholic-Protestant, small-large--are engaged in dynamic improvement projects on their campuses.

Fifty thousand baccalaureate degrees were awarded in Texas in 1979, and approximately 10,000, or one out of five, were granted by the independent colleges. The true significance of these colleges is found in the number and the quality of these graduates and their contributions to national, state and local advancement. Their steady high-level performance in Texas higher education is influential and irreplaceable.

Inflation makes it especially difficult to specify the financial assets of Texas independent colleges and universities, but the combined value of their physical plants and their endowments should have a value of well over $2 billion. (Ten years ago assets were estimated at over $1 billion.) These summary data certainly testify to the size and importance of these nonprofit, private enterprise, educational resources available to the citizens of Texas.

The 40 ICUT members have some similarities; however, they differ significantly in enrollment, programs (liberal arts, technical, research, preprofessional), faculty and student characteristics, annual tuition levels, financial resources and the quality and the nature of their physical plants and campuses. They are predominantly located near or in an area of the triangle formed by Dallas/Fort Worth, San Antonio and Houston, the most populous sections of the state.

Four of the independent colleges and universities are heavily research oriented; one has an international research reputation. Fifteen of the institutions grant some advanced degrees, but 24 of them are essentially liberal-arts senior colleges where undergraduate instruction is paramount. Six are high-caliber junior colleges.

Seven of the schools are "historically black" colleges, and 85 percent of their students are black. They meet a special educational need of black Texans and the black Texas society. Fifty percent or more of the enrollment at nine schools is black or Mexican American. The contribution of the independent sector to the education of the black and Mexican American population is especially noteworthy. Special commendations for the seven historically black and three of the Catholic institutions are in order for their education of minorities. These 10 institutions have 40 percent or more "minority" students. ICUT colleges provided education for over 12,000 (17 percent of total enrollment) minority students in 1979.

Comparisons with Out-of-State Colleges

Texas independent colleges enjoy a good reputation with educational leaders in other states. Representatives of these colleges play important roles in the National Science Foundation, the American Council on Education, The Council for the Advancement of Small Colleges, the National Association for Independent Colleges and Universities and a host of other reputable, important, educational associations. They have been selected and elected by their national peer groups consistently during the last decade.

Other states of similar size, such as Ohio, Illinois, Minnesota and Pennsylvania, have independent institutions with similar characteristics. In many cases, religious denominations are supporting colleges in several states, and student, faculty and institutional parameters are shared, discussed and evaluated. For example, The American Lutheran Church has 12 colleges in eight states, including Texas. Comprehensive instructional and management data, audit information and personnel development programs are handled cooperatively. Exchange of ideas takes place readily and freely among independent colleges throughout the nation.

The tuition and comprehensive fee charges of Texas institutions are significantly less than in many other states. Institutions of similar quality in the Midwest, the Great Lakes and the eastern part of the United States have much higher tuitions. Even private institutions in the less affluent states of the Southeast have higher tuitions and comprehensive fees.

Comparatively, students pay a smaller portion of the cost of the quality higher education they receive in Texas. Low tuition revenues are a way of life for Texas independent colleges. Educational quality would be even higher in Texas if more adequate funds were available from tuition sources in both the state-supported and the independent sector. In the absence of such a change in the public sector, appropriate increases in tuition in the independent sector are probably not possible.

Many states now have tuition assistance programs comparable to the Texas Tuition Equalization Grant Program. Some of these states have formulas which lead to generous aid for needy students; some states have entitlement grants for all state residents, and large appropriations assist students in the

independent colleges of those states.

Enrollment of students in Texas colleges from other states is affected in different ways by these financial forces. Nonportable tuition equalization grant programs tend to keep the students in their home states; low tuition and fee structures in Texas tend to attract some students. Recent increases in gasoline and air fares inhibit matriculation of out-of-state students.

In 1979 over 16,000 students from states other than Texas enrolled in the independent colleges. Over 3,000 aliens also enrolled in the independent sector in this past year. These students bring a very significant income to the state each year. Of course, some of the revenue is financial aid from federal sources. But more important, they bring alternate viewpoints, diversity and experiences which enrich the education and lives of all students. They also carry to their homes and in their lifestyle an expanded view of America and firsthand knowledge of the cultural heritage of the Southwest.

Opening/Closing/Merger

In the past decade a new institution, American Technological University, opened and gained accreditation. This institution, also a member of ICUT, now has an enrollment exceeding 800 students. The unique blend of technical and general education is an example of creative practice which exists in the independent institutions.

Some comprehensive studies of the independent sector of higher education were initiated by the Coordinating Board in the late 1960s. The reports of those studies provide names of colleges no longer in existence. A list of the names and locations of these colleges appears in Appendix C of this report. Two accredited senior institutions have closed (University of Corpus Christi and Dominican College of Houston). One unaccredited senior college also closed (University of Plano).

The demise of colleges in Texas in the late 1960s and in the decade of the '70s was restricted primarily to unaccredited junior colleges. The 1970 publication Pluralism and Partnership lists 13 unaccredited junior colleges, and apparently eight of these institutions have closed or merged with other institutions. Two accredited junior colleges also have closed, and several others have converted to senior college status.

Speculation about additional closings continue. However, the educational institutions of ICUT are quality institutions that do appear to have the ability to survive. The people of Texas, including many friends in the legislature, apparently are willing to make changes which will help them to survive, flourish, excel and continue to contribute to the education of young people in Texas.

Overview

A view of the enrollment and the wide spectrum of colleges that make up ICUT is presented in the following statements. In 1979

- the colleges ranged in size from 335 to 9,697 students;

- six institutions enrolled half of the students, about 37,000;
- seven of the colleges enrolled less than 500 students; and
- over 20 of the colleges enrolled between 800 and 2,400 students.

The colleges with enrollments between 800 and 2,400 are typical church-related, residential educational institutions, as found in many states of the nation. Most of the well-known religious denominations are involved with Texas independent colleges. This involvement varies from fairly close control and significant interaction to only nominal historic church affiliation, with relatively little exchange taking place between the denomination and the college.

Ten of the 40 ICUT colleges are affiliated with Baptists, six are Methodist, six are Catholic, three are Presbyterian, three are Church of Christ, two are Lutheran and two are Disciples of Christ. Church bodies sponsoring one college in Texas include the United Church of Christ, the African Methodist Church, the Christian Methodist Episcopal, Seventh Day Adventist, the United Methodist Church and the Assembly of God. Three independent colleges are not affiliated with any church body.

Even though two medium-size private colleges were absorbed by the state, the enrollment in the independent institutions has changed very little in the 1970s. Most of the colleges have remained about the same size; however, between 1975 and 1979, nine independent colleges increased their enrollments by more than 20 percent; three suffered at least a 20 percent decline in enrollment during this same five-year period.

The independent colleges have served about 74,000 students each year for the past decade. Will this service be maintained in the 1980s? Possibly, but some decreases are more probable. A few colleges and universities may not be affected at all; for some the impact will be difficult; for a few it could be traumatic.

Program Thrust

The academic programs offered in the various independent colleges of Texas have great variety and diversity. A few institutions offer primarily and predominantly general education (liberal arts), and their faculty and students are oriented strongly toward general education. A few colleges have programs which are technical and highly specialized. Some have only special-purpose programs, and some colleges are science and technology oriented. Most independent institutions in Texas offer some combination of general undergraduate education, perhaps best described as "arts and science" oriented, coupled with an emphasis in some specified career fields. Teacher education, business administration, social welfare, theology and health sciences curricula are often found to complement the traditional arts and sciences. Of the 34 senior colleges, 32 have programs approved by the Texas Education Agency. Twelve independent colleges have approved teacher education programs at the graduate level. Their teacher education graduates are sought by leading school districts. At Texas Lutheran College all 1980 graduates with education degrees have been placed.

Independent educational institutions assume responsibility for establishing and maintaining undergraduate, graduate and continuing education curricula for the Texas clergy. Greek and Hebrew language classes are found and are well populated on some church-related college campuses where preseminary programs are offered.

Graduate programs and professional schools at the major universities have properly limited the scope of their offerings to maintain quality and a distinctive program. Well-established programs in hospital administration, nursing, bilingual education, choral music and drama serve as a few examples of the special areas of strength of the colleges and universities of ICUT.

Continuing education courses, credit and noncollege credit, constitute a growing part of the program of ICUT colleges. The scope of programs appears to be very limited and directed toward specific special-interest groups. Course offerings at locations other than the main campus are in existence, but they are limited in locations, number and scope.

Faculty Characteristics

The ICUT colleges employ about 3,600 full-time faculty members. This number, like enrollments, has fluctuated only slightly in the past five years. Nearly three out of four faculty members are male; however, recent trends indicate a greater number of females are being employed, and the ratio should move to a more equitable position.

Faculty salaries at ICUT institutions are reported to be 15 percent less than average salaries in the state sector. Certainly this fact means substantially less discretionary money available to faculty members employed in the independent sector. Changes in salaries in the past decade in the public and in the independent sectors are similar. In the past 10 years McKnew reports that salaries "in the public sector in Texas increased by only 65 percent." Salary data available for the senior private institutions indicate a similar change.

Faculty in the independent sector, like their counterparts in the public sector, have suffered a substantial decrease in real purchasing power in the past decade. Grave concern for the financial well-being of the faculty and its impact upon the quality of instruction and morale is shared by the independent sector. Again, it should be pointed out that the great diversity which exists in the private sector leads to great differences in levels of compensation. Some institutions with more adequate resources provide competitive compensation. Other institutions existing on a month-to-month basis provide very low levels of compensation for their faculty and staff.

During the past decade, many independent colleges have been able to employ many more individuals with earned doctorates and terminal degrees. A large and steady increase in the number of faculty members with earned doctorates has been documented. In one institution an increase from 33 percent to 66 percent has been achieved. The implicit result is an even better prepared faculty and the opportunity to present an even higher caliber of instruction and research. The increase in accredited programs is also noted with pride.

Financial Aid

During the decade of the 1970s, colleges have seen a dramatic growth in the financial aid program. Until the 1970s financial aid was a relatively small part of the colleges' budgets, and it consisted primarily of academic scholarships and athletic grants. As we enter the '80s, financial aid is a large and complex function, usually involving at least a million dollars for each 1,000 students enrolled in a typical ICUT college. Approximately 65 percent of the students enrolled in independent colleges throughout the nation received some form of financial aid in the 1976-77 school year. It is safe to assume that comparable financial aid exists in Texas and that the percentage and the number of students assisted have grown in the past few years.

Financial aid is presented to students in several forms:

- scholarships based on academic aptitude or previous performance;
- grants based on need or special talents;
- federal, state and local loans; and
- work opportunities.

Federal, state, church and other private sources, as well as institutional funds, are used to provide financial aid. The general public does not realize the amount of student assistance available at these institutions. Many students can afford to attend these colleges.

The Texas Tuition Equalization Grant (TEG) program, created by the Texas Legislature in 1971, has assisted thousands of needy young Texans enrolled in the fully accredited, independent colleges. The educational opportunities provided by the independent colleges have saved the state and the taxpayer substantial sums of money, since it would have cost millions of tax dollars had these Texas students been provided an education in the state colleges.

In the 67th legislative session, changes were made in the statute which permitted some part-time students to benefit from the program. Also, the maximum grant was allowed to increase, based on a formula related to state expenditures for the education of students in the public institutions. Fifty percent of the amount expended by the state per student was set as a ceiling for TEG grants.

The original TEG legislation, based upon the recommendation of the Coordinating Board, also contained specific rules and regulations concerning Texas residency and financial need. It included provisions which eliminated students enrolled in a theological or religion degree program, as well as the recipients of athletic scholarships, from receiving the grants.

Undoubtedly, the tuition equalization program has been of great assistance to the independent sector in Texas. The liberalization of the financial guidelines has been and will continue to be exceedingly helpful. In the opinion of the author, the restriction regarding athletic scholarship recipients should be eliminated. Financial appropriations by the legislature to meet the complete need of full-time students also should

be provided. Full funding according to the formula is a necessity.

The possibility of an entitlement grant for almost all Texas residents attending private and independent colleges should be thoroughly explored. This approach is being used in other states, is easy to administer and recognizes the cost of the education being provided all Texas residents by independent colleges. The restrictions regarding preministerial students could, of course, remain an exception in an entitlement program.

Philanthropic Support

Most independent colleges in Texas receive less than the national average income from tuition. Therefore, all of the forms of voluntary support are especially important to the independent sector where federal and state direct assistance, if they exist at all, are very small. In the most recent issue of Voluntary Support of Education, 1978-79, gift receipts for many of the ICUT colleges are reported. Gifts to these colleges from private sources compare favorably with gifts to colleges located in other states. Of necessity, most Texas colleges have comprehensive fund-raising programs which reach foundations, corporations, alumni, churches and other friends. Indeed, a large portion of the gifts come from Texas sources, but considerable support is also made available to Texas colleges from sources outside the state of Texas. Grants from out-of-state foundations made some of the building projects mentioned earlier possible. At least one small college received over a half million dollars last year from out-of-state sources. The private independent colleges are responsible for bringing these financial commitments to the state economy.

Most of the senior independent colleges belong to either the Texas Independent College Fund or the United Negro College Fund. Both organizations solicit corporations and other appropriate sources for financial support for their members. The Texas Independent College Fund, formerly known as the Texas Foundation for Voluntarily Supported Colleges and Universities, has been reorganized and renewed within the past few years. It now also sponsors discussion sessions between presidents of independent colleges and top corporate leaders of Texas. The fund-raising activity has increased substantially. The fund is now seeking to raise one million dollars each year to support the 26 colleges which constitute its membership. Cooperative fund-raising organizations such as this have been very successful in other states. Large sums of money have been raised to support independent colleges and universities in this manner, and that potential also exists in Texas.

Independent college presidents have become accustomed to scrutiny of their organizations, faculty and alumni performance and audit reports by corporation presidents and trustees of foundations. Corporation presidents repeatedly mention the special high-quality, ethical preparation of graduates as their reason for supporting Texas independent colleges and universities.

College Studies and Institutional Research

The higher education enterprise has been studied extensively in the 35-year period since World War II. At times, the volume of material is overwhelming; the opinion of authors, conflicting. Quality, data and analyses are vital to decision-makers at all levels, especially those persons and boards making decisions which affect independent higher education in Texas. To assist in this arena, the Independent Colleges and Universities of Texas Research Foundation was formed as a nonprofit organization. It is funded by grants and contributions of the member colleges. Very recent support has come from the Richardson Foundation, the M. D. Anderson Foundation and the Strake Foundation. A Ford Foundation grant a few years ago provided funds for some initial comprehensive studies. The studies and reports about Texas higher education are carefully prepared, and they should assist the Coordinating Board and other decision-making bodies in their analyses of private higher education. In addition to some of these reports, this paper also lists references (see page 138) wherein summary statements and analyses of higher education within the nation and Texas have been presented.

The ICUT research commission presents an annual statistical report which shows yearly data as well as longitudinal summaries for the independent colleges. These data are exceedingly helpful in any consideration of the status, health, direction and potential of the private colleges in Texas.

Challenge of the '80s

This section of this paper presents selected challenges which face higher education in general, and independent colleges in Texas in particular, in the next few years. Because the early 1980s will be difficult, how well these challenges are met should be evident in the independent colleges by 1986. Enrollment maintenance, the level of institutional enthusiasm which can be maintained in a time of financial constraint and financial security are three important challenges.

Maintenance of Enrollment

Two publications regarding projected enrollment in colleges caught the attention of higher education and the public press in a dramatic way during the last year. One of the publications is titled High School Graduates: Projections for the Fifty States, and the other publication is a publication of Carnegie Foundation for the Advancement of Teaching titled Three Thousand Futures, The Next Twenty Years of Higher Education. Both publications show in specific and graphic forms the large projected decreases in the number of high school graduates and 18-year-olds between 1980 and 1989. While the pattern for Texas and contiguous states is less dramatic and the declines less pronounced than in other states, very few, if any, educators think Texas institutions will be unaffected.

Already student recruiters from other states are spending more time in Texas metropolitan areas. A decline in the number of out-of-state students attending Texas institutions will surely take place because of the lower 18-year-old population and the more active recruitment by institutions

in their home states. This widely heralded demographic depression will be felt keenly and broadly in Texas higher education and certainly in the independent sector.

In 1979 the independent colleges enrolled 22 percent or 16,400 of their students from states other than Texas. However, Texas, as a Sun-belt state, will likely continue to attract new residents with college-age children and some out-of-state students. It is hoped that this source of new students will soften decreases to be brought about by the decrease in 18-year-old Texans.

In addition to the numerous statistics provided in the two reports which have been cited, the information analysis division of the Texas Education Agency has provided charts which show a distribution of Texas high school graduates over the past decade according to ethnic origin. The pattern of the 1970s showed a fairly constant number of Anglo graduates, with about 500 additional black graduates and 1,000 additional Mexican American graduates each year. If these trends continue, and if the total high school graduate projection for 1984 is correct, there will be fewer than 100,000 Anglo graduates in 1984. Almost 38 percent of the high school graduates will be black and Mexican American minorities.

The above projections can be compared with similar figures from 1972 when more than 110,000 Anglo high school students graduated and a little less than 28 percent of the total graduates were black and Mexican American ethnic minorities. It is safe to assume that minority students will be more diligently recruited in the 1980s and that opportunities approaching greater equality in higher education will exist, especially for the Mexican American students. Independent and public colleges, particularly the less selective ones, will seek minority students to sustain enrollment. Appropriate financial aid for the minority student will be an absolute necessity for the students and for the colleges.

Some educators are identifying the teacher shortage at the primary and secondary levels in the 1980s, especially in the South and Southwest, including Texas. Private colleges have expertise in the preparation of teachers, and the programs are expedient to meet this need. Incentives to encourage native Spanish speakers to enroll in teacher preparation curricula are needed now. More preparation in early childhood curricula is urged.

Internal Enthusiasm

Faculty/Staff Morale. One of the most important challenges to be confronted in the 1980s by the colleges in the independent sector of higher education is that of maintaining high faculty and staff morale. A time of economic constraint and inflation leads to an erosion of compensation, comparable reduction in library acquisitions and instructional appropriations; this, attended by the departure of colleagues and friends whose services are no longer needed or affordable by the institution, can devastate morale. Some colleges encountered these morale-destroying forces during the late 1960s. The loss in time, energy and enthusiasm which they fostered was awesome. Larger budgets, new buildings, more endowment, etc., are joys; the opposites are depressants.

Under current enrollment circumstances, the percentage of faculty with tenure continues to increase while the opportunity for institutional and curricular flexibility decreases. The opportunity for faculty renewal through the employment of new persons from other backgrounds is not possible. In the past five years almost all college presidents and academic deans, as well as other faculty leaders, have become necessarily more interested in opportunities for successful faculty development and renewal. Conferences, workshops, leaves of absence, research opportunities and other methods for faculty renewal have been sought more enthusiastically and diligently in private institutions. Movement of faculty members from instructional positions into administrative staff positions has also increased in order to provide change in classroom assignments and make room for new special academic expertise and viewpoints.

Mayhew's new book, Surviving the Eighties, deals at length with management styles and devices to handle retrenchment, expecially in times of financial stress. Some main points emerge in the first four chapters of his book with respect to leadership. First, an institution needs strong leadership in order to survive. This strong leadership with the authority and the responsibility should be focused, preferably, in the president.

The president should use the authority to make adjustments very carefully, but without undue delay. Dr. Mayhew states that the presidents "still are chiefly responsible for securing necessary funding, personifying and representing the institution, and resolving those conflicts that inevitably appear in organizations."

In another clear and concise statement, Mayhew discusses an actual case study:

> Although the president consulted widely with faculty about financial matters and sought its support, he himself maintained a clear vision as to what conditions were and what had to be done. When difficult decisions had to be made, he had the moral strength to insist on stringent economies, a freeze on faculty appointments, restrictions on library acquisitions, and tight controls in increased levels of faculty compensations.

Mayhew's second main point deals with the sharing of concern and institutional data in a straightforward way, especially with the faculty. Faculty and staff are intrinsically interested in the continued welfare of their institutions, and they have a right to know some of the problems which are to be faced and the decisions which will be made to remedy those problems. Outstanding leadership attracts enthusiastic support to face the most difficult and depressing problems. Mayhew also urges strongly shared responsibility for all aspects of budget work within an institution.

The third point Mayhew makes is to avoid the temptation, particularly on the part of less affluent institutions, to solve anticipated enrollment and fiscal problems thruugh expansion and diversification, and further to expect that some new technology such as videotape, cable television or computers will alleviate or solve the crisis. Also, the historical thrust and style of the college, whatever blend of educational excellence and special purposes it embodies, should not be abandoned hastily.

Leadership and faculties in Texas colleges today appear to recognize these important points, and this awareness is a strength in Texas independent higher education.

Construction and Renovation. Independent colleges also sustain internal enthusiasm by constantly improving programs, adding new dimensions to existing programs and providing quality facilities as well as good support services, especially library materials and modern computer equipment. Inflation and reduced enrollment certainly impair the ability to do these things.

Deferred maintenance has received much attention in the press, but many Texas colleges, fortunately, are coupling major maintenance efforts and energy conservation construction with projects which eliminate barriers for handicapped students. While the campuses of some colleges with especially difficult financial problems show some signs of neglect, a dozen or more ICUT college campuses visited recently continue to show good signs of care and improvement. There are doubts in the minds of some Texas educators about the extent of the deferred maintenance problem. Indeed, it does exist on a few campuses, but it also exists in government buildings, churches and commercial establishments. ICUT colleges have improved their facilities in the past decade, and they move to the difficult 1980s from a position of improved facilities.

Financial Security

Some educators have asserted, with considerable vigor, that today's most vexing problem in higher education is inflation. This is most certainly true! And it is also true that institutions, as well as people, need some degree of financial security in order to perform effectively and efficiently. Much of the inflation problem is based on energy consumption and cost.

In the early 1970s an increase in energy expense took place, but in the last half of the decade, increases in costs, as shown in the table below, at Texas Lutheran were moderate. This was possible even with more residential students and increased floor space. Some old, less energy-efficient buildings were removed. Insulation, storm windows and better doors were provided. Care in the use of hot water, heat, light and air-conditioning was demanded. Consumption of natural gas was reduced by more than 20 percent between 1975 and 1980. More massive changes in equipment, roofing materials, ventilation and scheduling are being implemented in order to further reduce energy consumption to help hold expense constant.

Energy data for all independent colleges are not available, but information about energy costs at Texas Lutheran is shown below.

UTILITY SURVEY--ANNUAL EXPENSES

Utility	1975-76	1976-77	1977-78	1978-79	1979-80
Electricity	$147,606	$157,959	$166,992	$164,220	$185,089
Natural Gas	127,179	145,700	136,033	131,982	131,665
Water/Sanitation Service	6,548	9,954	10,066	16,900	11,860
TOTALS	$281,333	$313,613	$313,091	$313,102	$328,614

Some assistance on a matching fund basis by the Department of Energy has been helpful, but much more encouragement and assistance of this nature is urgently needed. Educational institutions should be leaders in discovering and implementing significant ways to reduce energy consumption. If given the opportunity, students will respond positively to leadership in meeting this national, state and institutional crisis.

Independent and state-controlled educational institutions have many ways to reduce the use of energy and still maintain a reasonable comfort and convenience level. Curtailment of the use of buildings at designated times is one of the difficult but important steps that needs to be taken. Keeping libraries open 24 hours a day, seven days a week cannot be justified from the position of energy or student use, except in very large universities (enrollments above 40,000). Computer centers and laboratories are another matter, and extended hours are easier to justify. Students have always had a tendency to invert day and night activities, and administrators need not acquiesce to this desire. Vacations for staff should be planned in such a way that certain facilities are not open and operated certain weeks of the year in undergraduate institutions. "Energy conservation week" has been good for TLC.

The financial well being of each college is the greatest challenge before Texas independent higher education. The institutions will need support from all sources, and they will need a public policy that recognizes the true cost and benefits of higher education in both the public and independent sector. The tremendous financial pressure on independent college administrators forces careful evaluation of all commitments. The positive aspect of this pressure is the demand for very prudent use of funds from students, the public and donors.

Managers of independent colleges, especially presidents and business managers, have some expertise and experience in dealing with financial pressures, and it is a strength they bring to their colleges. (Their stamina and their financial ingenuity have limits!) Their expertise, energy and fund-raising abilities are great assets to Texas education.

Management of College Athletics--Another Challenge

Intercollegiate athletics and the opportunities these contests provide for the healthy development of student athletes and spectators are very important to the independent colleges of Texas. Almost all institutions compete in a conference (Southwest (4), Lone Star (2), Big State (7), TIAA (4), Trans-American (2) and Texoma (3)). Five colleges are "independents," and they schedule outside of conference alignments. ICUT junior colleges also compete in intercollegiate athletic programs.

The small independent college provides opportunities for participation for a large fraction of the student body. The opportunity to participate in athletics and numerous other wholesome college activities is one of the leading reasons students enroll at a small college. This active involvement, participation and competition is a valid and vital part of their education and maturation.

The denial of Tuition Equalization Grants (TEG) to scholarship athletes at independent colleges by the state of Texas is unfair and discriminates

against the athletes, their families and the independent institutions. Aid is provided in the state colleges. With the new Title IX directions and subsequent growth in women's athletics, this matter needs careful review, evaluation and change.

The intercollegiate athletic program in state-supported colleges and in the independent sector is very strong, and it attracts great interest. Athletic fervor is probably above average in our state. Effective management of this activity requires a great deal of faculty and staff time, especially in the small college where the percentage of student participants is great, alumni interest strong and financial constraints extant. Recently, some well-publicized national incidents of fraudulent transcripts and athletes' participation in specious extension courses should provide incentive for more careful management of the collegiate athletic enterprise in Texas.

Maintaining integrity, controlling costs and monitoring time and the emotional energy demands placed upon undergraduate student athletes are important issues for college administrators, including the president, and the board of directors. A recent American Council on Education study, as reported in the Chronicle of Higher Education, states, "The spiraling cost of big time collegiate athletics is leading some institutions toward 'financial disaster.'" The report calls on presidents of institutions with highly competitive sports programs to begin a series of "SALT" talks aimed at de-escalating expenditures without downgrading the quality of competition. This procedure is surely wise and possible.

Southern Methodist University recently dropped baseball. Several private and state colleges have formed a nonscholarship league. Economic conditions demand consideration of these athletic financial matters. Guidance that provides less expensive schedules, shorter seasons, less preseason practice time and appropriate athletic grant and recruiting practices could preserve the opportunity for hundreds of students to participate. Guidance will need to come from the very highest levels of college management, or more intercollegiate athletic programs will need to be dropped from the college schedule. Colleges with ample funds should not be permitted to set the spending pace which eliminates the competition forever.

Planning for the Future--An Exciting Challenge

Quality in higher education is exceedingly difficult to legislate; however, the lack of appropriate standards is usually obvious. The maintenance of quality in all Texas higher education will certainly be critical in the 1980s. Many persons and institutions of the independent college sector would be pleased to participate in the planning and the accreditation of higher education in Texas. Commissioner Ashworth's diligence in monitoring the educational programs of out-of-state course offerings by many institutions is applauded. In Texas public institutions, a significant reduction in upper-level and graduate off-campus courses for extension credit (65 percent decrease) has taken place since 1976. During the same time period, another large decrease (27 percent) has taken place in upper-level and graduate off-campus resident credit courses. This careful work certainly helps with the maintenance of integrity and quality in Texas higher education.

The academic quality in higher education is determined, to some extent, by the educational quality at the secondary school level. If the commonly held ideas that more high school seniors are working longer hours in places of business, that out-of-class assignments receive less emphasis, and that alcohol abuse by high school students has increased, surely scholarship at the high school level will continue to decrease. The higher education community should assist superintendents, principals and teachers as they struggle with these matters and many other ones which would improve scholarship. The state of Michigan recently increased the legal drinking age from 18 to 19. Illinois is reported to have established a 21-year-old requirement for use of alcoholic beverages. Texas needs a similar change.

Commitments

The principal driving forces behind independent higher education are special commitments by faculty, staff and financial supporters to the purposes of the institution. Quality instruction for students, the elimination of some ignorance and prejudice and the promotion of a special belief or methodology selected by the college founders and perpetuators of an institution, are often apparent. The special component may find its origin in religion, theology, medicine, law, technology, science, research or some other cultural, moral or social facet of society.

The commitment of the leadership to the purpose and the direction of the college precedes success. Financial support, faculty dedication and alumni enthusiasm follow well chosen commitments if the leadership is strong. These commitments have led faculty to accept lower pay levels and heavier teaching loads. They are subsidizing Texas higher education. The taxpayers provide this subsidy even for wealthy families in the public sector.

Even with the gloomy projection for student enrollment in the 1980s, another Texas junior college has just changed to senior college status. They appear to be committed to their blend of education and special purpose. They will probably find resources to exist and to develop further. Many of the other 60 independent institutions, ICUT and all the others, will survive because a strong commitment is often present. However, some could fail. But the people of Texas will benefit most if the institutions with commitment and integrity not only survive and exist, but develop and flourish.

Changes in the 1980s

New Technology

Many presentations by "futurists" refer to the information explosion, new electronic methods of communication and possibilities of doing so much more in our homes, as opposed to current places of business, schools and public buildings. American society is in the midst of an electronic communication transformation which will affect people's lives and, to some extent, formal higher education. It is well known that the number of persons employed in agriculture has decreased and will probably continue to decrease. It is also apparent that a decrease in the number of persons employed in the industrial sector is taking place. Hence, more people will be involved in "office type" work, namely as managers and communicators of ideas and information. Even small colleges now have relatively sophisticated computers

(or access to them), and offices are equipped with memory typewriters, computer-assisted operations and other new word-processing machines. Students have progressed from longhand calculations to slide rules to electronic calculators, and now, to mini-computers. These changes and their successors will force change in higher education before 1990 arrives. An increased use of the electronic media is desirable, and people will have little time to consider and evaluate one wave of information before another wave arrives.

The entire higher education enterprise certainly needs to deal with this technology and the increasing impact it will have upon people, particularly students. The opportunities for more learning and greater intellectual challenge abound. The independent higher education sector in Texas is blessed with many faculty, staff and interested supporters with sound methods for meeting these challenges. And their "free enterprise" orientation permits rapid adjustment to changes in higher education, a luxury not enjoyed by large or bureaucratic operations.

Great change in formal higher education to be brought about by television still seems improbable. Commercial and public television have been with the American public and higher education for over 30 years and, while it has a tremendous impact upon communications and informal and supplementary learning, its direct use in formal instruction is still limited. This is not the case with computers, calculators and other electronic media, including videotape. Their potential is as great as other scientific laboratory equipment. The freedom and individual attention which can be provided for small groups of responsible students in independent colleges as they learn to use and study with these media have great potential for instructional change. It is already taking place on many of our college campuses. More applications will follow in the 1980s. The teaching style in small colleges will be a strength in this effort.

Recruiting Practices

The recruitment of students in the 1980s will demand the highest standards and integrity. There will probably be a limit reached soon in the mailings, brochures and posters distributed by colleges. But more personal contacts and good counseling will increase, and this should help students.

Lavish no-need scholarships in both the private and public sector should be curtailed. They are difficult to uncover and document, but there is evidence of their existence and some misuse. All scholarship funds should be a part of audited records of the colleges and universities, and they need to be monitored carefully. The partial return to the merit scholarship philosophy has many pitfalls. They can be avoided, and most people of the independent sector are committed to ethical student recruitment practices.

Conclusion

In a time of inflation and financial constraint the leadership of these independent colleges, their governing boards, presidents, other administrators and faculty must discover ways to provide quality educational experiences in an efficient, effective, economical manner. The future of each institution will probably be determined by how well this complex challenge is met. But with assistance from foundations, church, state and friends, most, if not

all, of the independent sector will survive the 1980s because

- they will strive for academic quality and education of the whole person;
- they will maintain a competent, dedicated faculty and staff who care about students;
- they will feature the interests of lively minds, and the students will sense purpose and issues of importance;
- they will be managed carefully; and
- they will be strengthened by successfully meeting adversity, and even stronger institutions will emerge as a result of this testing.

Many independent colleges of Texas have used the past 10 years to strengthen their academic and financial positions. Tests of these positions will take place in the '80s, and for the most part they will be met. At least 40 institutions face this future with some confidence, renewed determination and some knowledge of what to expect.

NOTES

[1]PLURALISM AND PARTNERSHIP. The Case for the Dual System of Higher Education, 1968.

[2]PROGRAM FOR PARTNERSHIP. Issues and Principles for Pluralism in Higher Education, 1970.

[3]WORKING PAPERS ON THE INDEPENDENT SECTOR OF HIGHER EDUCATION IN TEXAS. ICUT, 1976.

[4]ANNUAL STATISTICAL REPORT OF THE RESEARCH COMMISSION. ICUT, 1980.

[5]LOST IN THE INDEX, by Charles R. McKnew, Jr., A Report to the Coordinating Board, 1980.

[6]STATE POLICY ISSUES AFFECTING INDEPENDENT HIGHER EDUCATION. National Institute of Independent Colleges and Universities, 1980.

[7]OPENINGS, CLOSINGS, MERGERS AND ACCREDITATION STATUS OF INDEPENDENT COLLEGES AND UNIVERSITIES, WINTER 1970 THROUGH SUMMER 1979. National Institute of Independent Colleges and Universities, 1980.

[8]THREE THOUSAND FUTURES, THE NEXT TWENTY YEARS FOR HIGHER EDUCATION. A Report to the Carnegie Council; Jossey-Bass, Inc., Publishers, 1980.

[9]HIGH SCHOOL GRADUATES: PROJECTIONS FOR THE FIFTY STATES. Western Interstate Commission for Higher Education, 1979.

[10]HISTORICAL AND PROJECTED GRADUATES FROM TEXAS PUBLIC SECONDARY SCHOOLS. Texas Education Agency, Information Analysis Section, 1979.

[11]MANAGEMENT OF STUDENT AID, A GUIDE FOR PRESIDENTS, by E. El-Khawas, American Council on Education, 1979.

[12]SURVIVING THE EIGHTIES, by Lewis B. Mayhew, Jossey-Bass, Inc., Publishers, 1980.

[13]VOLUNTARY SUPPORT OF EDUCATION 1978-79. Council for Financial Aid to Education, 1980.

[14]INTEGRITY AND QUALITY IN TEXAS EDUCATION; A Forum Sponsored by the Advisory Committee of the Texas ACT Council, 1980.

[15]INDEPENDENT HIGHER EDUCATION, by Minter and Bowen, National Institute of Independent Colleges and Universities, 1980.

[16]THE COMMUNICATIONS REVOLUTION AND THE EDUCATION OF AMERICANS. Change Magazine Press, 1980.

APPENDIX A

INDEPENDENT COLLEGES OF TEXAS
ICUT Members

Name	Location	Enrollment*	Level
Abilene Christian University	Abilene	5,214	Sr/Grad
American Technological Univ.	Killeen	835	Sr/Grad
Austin College	Sherman	1,130	Sr/Grad
Baylor University	Waco	9,697	Sr/Grad
Bishop College	Dallas	915	Senior
Concordia Lutheran College	Austin	334	Junior
Dallas Baptist College	Dallas	1,010	Senior
East Texas Baptist College	Marshall	851	Senior
Hardin-Simmons University	Abilene	1,839	Sr/Grad
Houston Baptist University	Houston	1,933	Sr/Grad
Howard Payne University	Brownwood	1,173	Senior
Huston-Tillotson College	Austin	634	Senior
Incarnate Word College	San Antonio	1,468	Sr/Grad
Jacksonville College	Jacksonville	326	Junior
Jarvis Christian College	Hawkins	622	Senior
LeTourneau College	Longview	966	Senior
Lon Morris College	Jacksonville	368	Junior
Lubbock Christian College	Lubbock	1,241	Senior
McMurry College	Abilene	1,450	Senior
Our Lady of the Lake Univ.	San Antonio	1,737	Sr/Grad
Paul Quinn College	Waco	412	Senior
Rice University	Houston	3,498	Sr/Grad
St. Edward's University	Austin	2,181	Sr/Grad
St. Mary's University	San Antonio	3,374	Sr/Grad
Schreiner College	Kerrville	357	Junior
Southern Methodist Univ.	Dallas	8,911	Senior
Southwestern Adventist College	Keene	731	Senior
Southwestern Christian College	Terrell	335	Junior
S.W. Jr. Col. Assemb. of God	Waxahachie	566	Junior
Southwestern University	Georgetown	1,001	Senior
Texas Christian University	Fort Worth	5,930	Sr/Grad
Texas College	Tyler	444	Senior
Texas Lutheran College	Seguin	1,358	Senior
Texas Wesleyan College	Fort Worth	1,580	Senior
Trinity University	San Antonio	3,285	Sr/Grad
University of Dallas	Irving	2,391	Sr/Grad
Univ. of Mary Hardin-Baylor	Belton	1,077	Senior
University of St. Thomas	Houston	1,765	Sr/Grad
Wayland Baptist	Plainview	1,311	Senior
Wiley College	Marshall	602	Senior

*Fall Enrollment 1979-80

APPENDIX B

[1]OTHER INDEPENDENT INSTITUTIONS OF TEXAS

Name	Location	Enrollment[2]	Level
Arlington Baptist College	Arlington	403	Senior
Austin Presbyterian Theo. Sem.	Austin	208	Grad.
Commonwealth College of Sciences	Houston		Tech.
Dallas Bible College	Dallas	216	Senior
Dallas Christian College	Dallas	140	Senior
Dallas Theological Seminary	Dallas	1,117	Grad.
Devry Institute of Technology	Dallas	667	Tech.
El Paso Christian College	El Paso	32	Senior
Episcopal Theo. Sem. of the S.W.	Austin	75	Grad.
Gulf-Coast Bible College	Houston	330	Senior
Northwood Institute	Cedar Hill	400	Junior
Oblate College of the Southwest	San Antonio		Grad.
Southern Bible College	Houston	116	Junior
South Texas College of Law	Houston	1,067	Prof.
Southwestern Bapt. Theo. Seminary	Fort Worth	3,291	Grad.
Tex. Col. of Osteopathic Med.	Fort Worth	299	Prof.

[1]Not members of ICUT

[2]Fall enrollment 1978-79

INDEPENDENT HEALTH PROFESSIONS SCHOOLS OF TEXAS

Name	Location	Enrollment*	Type
Baylor College of Dentistry	Dallas	512	Health
Baylor College of Medicine	Houston	772	Health
Baylor Univ. Army Medical Service School	San Antonio		Health
Baylor Univ. School of Nursing	Dallas	460	Health
Texas Chiropractic College	Pasadena	295	Health

*Fall enrollment 1978-79

APPENDIX C

INDEPENDENT COLLEGES OF TEXAS

Colleges Closed or Merged in the 1970's

Name	Location
Allen Academy	Bryan
South Texas Junior College	Houston
Annunciation College	Victoria
Christian College of the Southwest	Dallas
Christopher College of Corpus Christi	Corpus Christi
Fort Worth Christian College	Fort Worth
Mary Allen Junior College	Crockett
Butler College	Tyler
Westminster College	Tehuacana
University of Plano	Plano
University of Corpus Christi	Corpus Christi
Dominican College	Houston

APPENDIX B

[1]OTHER INDEPENDENT INSTITUTIONS OF TEXAS

Name	Location	Enrollment[2]	Level
Arlington Baptist College	Arlington	403	Senior
Austin Presbyterian Theo. Sem.	Austin	208	Grad.
Commonwealth College of Sciences	Houston		Tech.
Dallas Bible College	Dallas	216	Senior
Dallas Christian College	Dallas	140	Senior
Dallas Theological Seminary	Dallas	1,117	Grad.
Devry Institute of Technology	Dallas	667	Tech.
El Paso Christian College	El Paso	32	Senior
Episcopal Theo. Sem. of the S.W.	Austin	75	Grad.
Gulf-Coast Bible College	Houston	330	Senior
Northwood Institute	Cedar Hill	400	Junior
Oblate College of the Southwest	San Antonio		Grad.
Southern Bible College	Houston	116	Junior
South Texas College of Law	Houston	1,067	Prof.
Southwestern Bapt. Theo. Seminary	Fort Worth	3,291	Grad.
Tex. Col. of Osteopathic Med.	Fort Worth	299	Prof.

[1]Not members of ICUT

[2]Fall enrollment 1978-79

INDEPENDENT HEALTH PROFESSIONS SCHOOLS OF TEXAS

Name	Location	Enrollment*	Type
Baylor College of Dentistry	Dallas	512	Health
Baylor College of Medicine	Houston	772	Health
Baylor Univ. Army Medical Service School	San Antonio		Health
Baylor Univ. School of Nursing	Dallas	460	Health
Texas Chiropractic College	Pasadena	295	Health

*Fall enrollment 1978-79

APPENDIX C

INDEPENDENT COLLEGES OF TEXAS

Colleges Closed or Merged in the 1970's

Name	Location
Allen Academy	Bryan
South Texas Junior College	Houston
Annunciation College	Victoria
Christian College of the Southwest	Dallas
Christopher College of Corpus Christi	Corpus Christi
Fort Worth Christian College	Fort Worth
Mary Allen Junior College	Crockett
Butler College	Tyler
Westminster College	Tehuacana
University of Plano	Plano
University of Corpus Christi	Corpus Christi
Dominican College	Houston

POTENTIAL IMPACTS OF WATER RESOURCES ON HIGHER EDUCATION IN TEXAS

by Robert M. Sweazy, Lloyd V. Urban and George A. Whetstone

The vastness of the state of Texas is reflected in the wide range of its surface and groundwater resources. Although a total of about 28 inches of precipitation occurs each year statewide, local averages range from less than eight inches at El Paso to more than 56 inches in extreme East Texas. Major groundwater supplies provide fresh water for municipalities, industries and agriculture throughout Texas.

Historically, the people who settled Texas were seeking land, water and other resources and amenities of life. (Things really haven't changed very much.) Over the years the Texas economy has grown and diversified as the population and markets have increased. Although still heavily supported by agriculture and the petroleum industry, the economy now encompasses a broad range of manufacturing and service industries--stabilizing factors in times of national economic stress.

The growth in population, industry and agriculture creates an ever-increasing demand for available water resources. The citizens of Texas have been fortunate in that appropriate state, regional and local agencies were established to address the problems of water resources development and protection. Agencies such as the Department of Water Resources (formerly the Texas Water Rights Commission, Quality Board and Development Board), various river basin authorities and underground water conservation districts have provided for orderly, timely and effective water resources planning.

Even with all this good planning, problems related to water resources continue to occur. Floods, hurricanes, droughts, groundwater depletion and land subsidence are quantity-related problem areas. Quality problems include return flows, water pollution, salinity and saline-water encroachment associated with groundwater pumping. Some of these problems are solvable--others are not. Some of the solutions will be expensive and will require decades to implement. Individuals and institutions, even if not directly involved in water resources planning, should be cognizant of these problems and should make water resources a consideration in their own planning process. This paper will investigate the role of water resources in planning for higher education in Texas.

The influences of water resources on Texas civilization and higher education are many and complex. Except, however, for the temporary disruptions due to intense storms and floods and, to some extent, for the longer pseudo-cycles of drought, it can be anticipated that the effects will be modified by accompanying social and physical phenomena which would render a precise evaluation of the influence of water resources *per se* incalculable.

Historically, the Great Plains area, like other semiarid regions, has experienced major out-migration in response to sustained droughts. Many of the pioneers settling on the plains in the 1870s avoided starvation only through the aid of nearby military garrisons. Numerous drought-related

deaths were reported in the 1890s. A major exodus from eastern Montana and the Dakotas occurred between 1916 and 1920. The Dust Bowl of the 1930s was accompanied by foreclosures on owners, eviction of renters and land abandonment. It was also accompanied by a recognition of governmental obligation to provide loans and other assistance. The consequences of this fundamental change in the philosophy of government have been so all-pervasive since that any analysis of response to water shortages must necessarily consider the social programs which would be employed to mitigate the effects.

Predictions of drought have been made on the basis of statistical manipulations applied to historic and paleontological data, modified in some cases by an application of the principles of astrology, cosmology and metacosmography. Self-deception, if not charlatanism, seems to be present in many cases where occult skills in data processing and result evaluation have produced findings substantiating the manipulator's dogma.

Bowden,[1] in an assessment of the probability of desertification occurring on the Great Plains, cited a prediction of an imminent ice age to be caused by man-made pollution and also a refutation of that thesis by a calculation of the high levels of carbon dioxide and other pollutants which would be required for any noticeable change. The historic pattern of droughts has been shown to be a reasonable statistical consequence of the frequency changes observed in the general upper-air circulation pattern. Moreover, neither the ice age doctrine nor that of probabilities associated with circulation changes would substantiate a prediction of extreme drought in the United States. With the ice-age hypothesis, summer precipitation should increase outside the tropics while severe droughts would be anticipated in southern Asia and Sahelian Africa. With the probabilistic theory, statistical analysis based on 700 years of precipitation records on the plains indicates that the probability of the recurrence of a drought of the intensity of that of the 1930s is once every 300 to 400 years. Bowden concluded that "practically every major interpretation predicts conditions appreciably better than those in the recent past."

While drought is the water-related phenomenon of major concern in much of Texas, it is overshadowed on the High Plains by the potential economic exhaustion of fossil aquifers. When water is withdrawn from the Ogallala and underlying saline aquifers, it is not naturally replaced by percolation at a rate having any practical significance. The groundwater is, in fact, mined. As the water table drops, flow to wells decreases. The smaller inflow to each pump is handled at lower efficiency since the pump impeller would no longer be operating near its design characteristics. Thus, even if energy prices were to remain constant, the water supply cost would increase due to poorer efficiency and the expense of well and pump modification. In fact, however, energy costs have soared to such an extent that an irrigator is frequently unable to justify pumping water which underlies his land. A fresh start in the city on the part of the entire family, or of many of its younger members, becomes more attractive as financial stringencies close in.

The drift to the cities, while not dependent solely on water resources, is responsive to drought, increased cost of water and legal restraints on water use (particularly quality requirements on wastes discharged)--as well as on other governmental and economic pressures. As production costs have risen on the farm, mechanization and increased individual (or often corporate) landholdings have been necessary for economic survival. The burden of compliance with environmental regulations is much greater, on a per-head basis, on small feedlots and dairies than on large ones.

College enrollment from rural areas could, however, easily increase substantially even from the decreased total population remaining on the resulting larger, more technologically demanding farms if more young rural residents elected to prepare themselves for a rewarding urban future or to strengthen their understanding of the complexities of modern agriculture.

Urbanization of the arid and semiarid regions of the southwestern United States is a phenomenon of increasing significance in this century. El Paso-Juarez, Amarillo, Lubbock, Albuquerque, Tucson, Phoenix, Las Vegas and Los Angeles--all with reasonably healthy economies and with undiminished enthusiasm for further growth--are now far larger than could be accounted for by an inventory of the agricultural potential of their immediate trade areas. Their dependence on agricultural production has been eased to a substantial degree by their Sunbelt climates; their development of electronic and other non-water-intensive industries; their willingness to go far afield for municipal water supplies and then to reuse the effluent for irrigation, industrial cooling and other purposes--as well as their modern transportation facilities. The complex economy of large cities requires that a higher percentage of the population be better educated at the same time that it concentrates many potential students within convenient distances of educational institutions. These same factors, however, make predictions of enrollment distribution among senior colleges, junior colleges and vocational training schools difficult.

No direct correlation could be determined between college enrollment patterns and previous-year precipitation rates because of the influence of numerous other variables affecting agricultural prosperity. In an area where potential evaporation is several times as large as the average precipitation, the timing and the amounts in individual rainstorms are of critical importance. Income from petroleum production is relatively independent of precipitation and is also a factor in the local economies. In counties with large irrigated areas rainfall is of less significance than crop prices in determining family affluence. There are indications, however, that very wide fluctuations in the attendance from any county at any particular school can occur with little correlation being evident with precipitation or with total attendance from the county at all schools.

Droughts, as we have seen, can be predicted only in a general statistical sense. Their effects on college enrollment--dropouts, postponement or abandonment of initial registration, transfers to schools nearer home or where part-time employment is available, changes in programs to facilitate part-time employment, augmented student loan programs, etc.--are rather immediate, short-lived and can probably be anticipated on a semester-to-semester basis accurately enough to permit each college to implement contingency plans for its course offerings. Storms and floods should seldom involve more than schedule delays and costs of rehabilitation.

Since the problems for higher education associated with water resources in East Texas, for the next half century at least, should be of short (even if sometimes violent) duration, there would not appear to be much justification for attempting at this time to formulate any very explicit plans for adjusting to them.

Long-range planning, particularly in West Texas, should take into consideration the competition for water among agricultural, industrial, municipal, recreational and esoteric interests.

The price that agriculture or industry can afford to pay for water is sharply limited by the return which can be expected from the resulting product. Analyses of cost-return data at a particular time and place invariably show a much greater "value" when water is used in industry than when it is used in agriculture. The viability of the large urban concentrations in arid or semiarid settings is a direct consequence of this condition. The specter of ultimate food shortages in a famine-prone world, accompanied by the resulting adjustments in the value of water for agriculture, is easily overlooked as water rights are cannibalized on an acre-by-acre basis.

Municipalities, like industries, can outbid agriculture for a water supply. In fact, if the seller is reluctant there is always eminent domain. A fortunate aspect of industrial and municipal use of water is that it is largely nonconsumptive. That is, the used water, augmented by various "wastes," is discharged by treatment plants back to the environment. In many cases in Texas this effluent is reused for agricultural and/or industrial purposes.

The diversion of water supplies from agricultural to municipal and industrial uses tends to further decrease the population in rural areas and to increase it in the cities. The percentages of the augmented urban populations attending college would be subject to wide variations, since such factors as age, financial status and motivation would probably differ widely on the basis of local situations. It is unlikely that many universally valid correlations between such population change and college attendance could be found.

Water allotments for recreation can also have contradictory influences on college enrollment. If stream flow regimes and reservoir storage levels are modified to enhance recreation at the expense of optimum irrigation or water supply management, the resulting losses (evaporation and flow to the Gulf or to less-efficient downstream uses) may be detrimental to the economic base and, thus, would be expected to decrease college enrollment. On the other hand, college-age people tend to place a high value on the availability of water-based recreation, and many of them could be expected to give this factor high priority in their selection of a college.

Impact of Federal Regulations

The greatest water-related threat to the Texas economy, however, does not arise from the potential transfer of water rights among agricultural, municipal and industrial applications. And recreational use, so long as it be governed only by Texas water law, is also subject to economic constraints which would assure reconversion as needs dictate. (Lawn-watering restrictions during droughts or during hours of high evaporation are familiar examples of this.) Federal programs are capable of creating serious local disruptions which could impact on college enrollment. Their greatest threat resides in the ability of the federal government to override state water laws--and in its increasing willingness to do so.

Within the past two years callous invasions of state water rights, accompanied by proposals of rashly imprudent use of the water to be confiscated, have been seriously studied by a consortium of federal agencies acting under the express orders of the President.

While there are many objectionable elements and few saving graces in the proposed Water Policy Initiatives, the three features which would appear to affect Texas most detrimentally if they were to be implemented are (1) the requirements of minimum instream flows, (2) the extension of federal regulation to groundwater and (3) the assumption of control of playa lakes.

These three examples serve to illustrate the potential impact upon local economies that federal intervention creates. As has been noted previously, economic disruption can change established trends in college enrollment.

Many of the "streams" of West Texas contain more dust than water. For example, a flow gauge maintained on the North Fork of the Double Mountain Fork of the Brazos River at Lubbock, at a point where the maps show over a hundred miles of channel upstream, went eighteen months (September 1939-February 1941) before the first flow was recorded. A 26-month period without flow occurred from August 1944 through September 1946. This dry spell was broken by a total flow of 6.7 acre-feet in October 1946. In the following 30 months the only measurable flow was 4.6 acre-feet in May 1947. The gauge was removed in October 1949, after having recorded a total flow of 12,096.7 acre-feet in 120 months of operation. The three months of greatest flow accounted for 73.4 percent of the total. While it would not be physically impossible to establish some permanent stream flow at such a point, it would constitute a tragic waste of resources to do so.

Groundwater, under Texas law, is the property of the owner of the land in which it occurs until or unless he transfers his title to it. Subject to general provisions of state law governing waste and pollution, regulation is by water districts established by local electors. Under this doctrine the High Plains of Texas has developed into a major agricultural region which contributes significantly to the prosperity of Texas and to the very precarious balance of trade of the United States. There is no reason to believe that federal regulation would enhance, or even maintain, this status. It could, in fact, lead to stagnation if various proposals made from time to time to terminate groundwater mining were to be enacted.

Playa lakes provide an excellent example of an unusual water phenomenon which is misunderstood by the federal bureaucracy.

The topographic explanation of the negligible flow from over a hundred miles of channels at the gauging station cited earlier is that the contributing watershed is very narrow. Some 90 percent of the High Plains area consists of internal drainage basins averaging less than a square mile in extent and draining to shallow ephemeral lakes, known locally as playas. These lakes, in contrast to perennial lakes and to some of the overflow lakes in river bottoms, are on private land. The water contained in them is the private property of the land owner, to which no riparian rights attach and to which the appropriate statutes are not applicable.

Historically, some 90 percent of this water evaporated and some 10 percent infiltrated. Few of the lakes retained water from one rainy season to the next. Increasingly, over the last 20 or 30 years, the water of these lakes has been used for irrigation. This practice has been beneficial for several reasons:

1. The lake water is an additional supply which raises the farmer's potential income and/or prolongs the period of viable irrigation

by deferring the pumping of groundwater from the underlying Ogallala Aquifer. The energy requirement for a low-lift lake pump is only a small fraction of that for a pump lifting groundwater.

2. Pumping of water from playa lakes increases the owner's potential crop land by reducing the area of land flooded. To obtain full advantage of this phenomenon, it may be necessary to plant crops that can tolerate some flooding and/or to modify the lake topography by excavating a pit in the deep part of the lake, using the excavated material as fill in the shallow portion. This practice (lake modification) has the further advantages of saving water because of the lesser evaporation associated with a smaller exposed surface and the elimination of evapotranspiration from the rank weed growth which tends to occur in shallow water. The elimination of weeds is accompanied by the elimination of mosquitoes.

3. Playa lake water, much of which has flowed several thousand feet overland in reaching the playa, contains some top soil and fertilizing nutrients which can be recycled. This phenomenon is enhanced when, as is frequently the case, the modified lake is also employed as a tailwater recovery pit. Tailwater recovery, in turn, improves irrigation efficiency, permits use of water from highway borrow ditches which might otherwise pond on the roadway and reduces any pollution potential in the runoff by lessening the runoff.

4. Temperature of water pumped from the Ogallala during the irrigation season has been reported to average about 63°F; that of lake water is above 70°F. Since most crops are highly sensitive to soil temperature, better performance can be obtained from lake water.

5. In addition to the saving of water and land, cited in points 1 and 2 above, lake modification has the advantage of providing storage for water until it is needed. When playa lakes are naturally full, the "upland" soil is also saturated. Water in a modified playa will be available, and warmer, when the crops can use it a few weeks later. Moreover, modified playas will support fish; natural playas do not.

It should be emphasized that playa lakes are not logically classifiable as "wetlands." In their natural state they are dry for extended periods from time to time. If these privately owned lands containing valuable privately owned water were to be so classified and if the objective expressed in a recent draft release of the U.S. Department of Agriculture of "reducing to zero the net loss of wetlands resulting from agricultural uses" were to be pursued fanatically, humans and fish would find themselves discriminated against with the principal beneficiaries being mosquitoes.

Modifications of playa lakes are also the subject of a so-far undisclosed set of regulations being prepared by the Federal Fish and Wildlife Service. The latest reports indicate that the Texas congressional delegation will have been successful in thwarting federal efforts to control lakes of five or more acres. However, lakes of 100 or more acres may yet fall prey to stultifying federal domination.

The Texas Department of Water Resources has pointed out that more than

half the land area of Texas overlies one or more of the seven major and 17 minor aquifers of the state. At present they supply about 70 percent of the more than 12 million acre-feet of water used each year in Texas. The dependable surface supply of about 15.1 million acre-feet per year could be augmented by about 5.3 million acre-feet by additional development. The projected annual requirements for the year 2000 are 27 million acre-feet, and for the year 2030 are 39.6 million acre-feet. Uses much more vital than the aesthetics of flowing streams and an undiminished habitat for migrant waterfowl are at stake.

Effect of Higher Education on Water Resources

To this point, this paper has been concerned with the impact of water resources on higher education. It might be well to note that higher education also can and does have a significant effect on water resources. Problems such as those previously outlined will be solved by individuals--primarily scientists and engineers--with the skills and expertise required to formulate and implement the required strategies. Institutions of higher education are, of course, the primary producers of people with these skills and expertise.

Currently, college graduates in a water resources area are in high demand, frequently commanding starting salaries rivaling those of their professors. Consequently, just as in many other areas, fewer are continuing their education by pursuing master's and doctor's degrees, and more and more of their professors are joining them in turning toward industry.

Although it is becoming a tired argument, it is nonetheless a fact--problems of inadequate faculty salaries, obsolete laboratory equipment and meager graduate student assistance programs literally plead for financial support. To quote a recent Engineering News-Record editorial,

> ...the U.S. is headed into deep trouble with its present inability to produce engineers with master's and doctor's degrees in engineering. The 1980 shortage of engineering teachers is estimated at about 2,000. And there are not enough PhD's for high technology and industries either. Innovation, productivity and the economy itself must suffer in the long run....But it becomes increasingly clear that government has a real stake that ought not be put off until time of national emergency to maintain a profession so vital to the general health of the national economy.

Specialization within the broad field of water resources is quite common. Hydrologists and atmospheric scientists are concerned with the measurement and prediction of the quantity, and often the quality, of water supplies to be anticipated from precipitation, in stream flows or in aquifers. A career of ever-increasing importance is that of water law. Contests over water rights have often led to extensive litigation; for example, a round in the early 1960s of Chicago's near century-long dispute over diversion of water from Lake Michigan required four years of hearings in which the testimony ran to some 26,000 pages.

The planning, construction and operation of physical works for water supply and treatment, irrigation, hydroelectric power, navigation and flood control fall generally in the province of civil engineering. Many of the specialties in irrigation, however, are the responsibilities of agricultural

engineers, and those in hydroelectric power may fall to mechanical or electrical engineers. Planning, in particular, has become a much more complicated process in recent years with the increasing burden of environmental impact analysis and of compliance with a myriad of other governmental restraints.

In terms of educational needs, this restrictive environment demands more trained professionals with a wider background and more comprehensive understanding of a rapidly changing field of practice. It also demands more intensive and more extensive research.

To meet this challenge the universities have added courses, degree programs and seminars. They have engaged in research covering a wide spectrum extending from the seeking of fundamental knowledge on the mechanics of fluid flow through the very detailed applied problems of water supply provision for regions, cities, industries or projects of some other nature, to the investigations of environmental concern in wastewater reuse, agricultural and urban stormwater runoff and hazardous waste disposal.

Long-range planning for the future water supplies of Texas must include generous provision for the education of the people who will formulate and implement the plans and of those who will operate the resulting projects.

Conclusions and Recommendations

The following conclusions, condensed from the previous discussion, are made on the basis of current trends and projections in water resource development anticipated during the next two to three decades.

1. The severity of the various water problems that will afflict Texas in the future cannot be forecast precisely at this time. Aside from the short-term problems (e.g., droughts and floods), most of their impacts on higher education will be subtle and indirect.

2. Water problems are most likely to influence the educational structure through their effects on the general economy and the resulting population changes.

3. For the next 20 to 30 years, water problems should have little predictable impact on higher education in the wetter areas of the state.

4. If present trends continue, water supplies could be seriously diminished in many of the drier areas.

    a. Regional water shortages could accelerate the trend toward urbanization. (At the present time over half the total population on the Texas High Plains resides in Amarillo, Lubbock, Midland and Odessa; most of the population of Trans-Pecos Texas lives in El Paso.) Such a development could well lead to increases in enrollment in colleges in or near these cities.

    b. With greater severity of depletion, some major regions of the state could suffer a substantial loss in total population--rural and urban. Junior colleges in such regions could be seriously impacted.

5. A major impact on the Texas economy could result from federal intervention in the state's water management.

   a. Such intervention could be beneficial if it takes the form of water importation to water-deficient agricultural areas (e.g., the High Plains and/or the Rio Grande Valley), or helps alleviate subsidence and salt water intrusion in coastal areas. In this case, higher education in the affected areas would undoubtedly prosper.

   b. Federal intervention could have the reverse effect on higher education if it overrides Texas water law in the management of existing water supplies.

6. As water needs mount, it is reasonable to assume that many recreational lakes and flowing streams will be cannibalized for domestic, industrial and agricultural uses. Such actions may decrease the recreational appeal of an institution in the area, discouraging enrollment by those who place a high priority on water-based recreation.

7. The problems associated with water resources continue to outstrip known, available solutions. Higher education can play a significant role in water resources planning through research and through the development of scientists, engineers and other specialists trained to meet the problems and challenges of the future.

As a result of these conclusions, the following recommendations are offered:

1. College and university personnel should develop contingency plans for reducing water usage in drought situations. If, for example, a 20 percent reduction is needed, plans for meeting this requirement (e.g., reductions in lawn watering, installation of water-saving devices, educational programs, elimination of water leaks, etc.) should be readily available.

2. Contingency planning for other emergencies (floods, contamination, etc.) would also be desirable. Preparedness for a situation such as that which recently developed in Georgetown is a good example.

3. Campuses with little or no access to natural water-based recreational facilities may alleviate this deficiency through the construction of aquatic centers which can provide year-round enjoyment and can double as facilities for education and intercollegiate athletic competition.

4. Efforts should be made to increase levels of support for interdisciplinary water research programs at institutions of higher education. This includes increased funding for facilities, faculty salaries and student assistance programs. Only in this manner can the state hope to solve its most pressing problem--water.

NOTES

[1]Bowden, Martyn J. "Desertification of the Great Plains: Will it Happen?" Economic Geography 53 (1977), pp. 397-406.

[2]Engineering News Record, May 8, 1980.

PART II

Testimony from the Academic Community

SIGNIFICANT ISSUES CONFRONTING HIGHER EDUCATION IN TEXAS IN THE 1980s

by William R. Johnson*

Madam Chairman, members of the Coordinating Board, I am William Johnson. I am here as chairman of the Council of Presidents of the Public Senior Colleges and Universities of Texas, and I am representing that organization. I would like to say that following my presentation I will ask Dr. Ed Bishop, president of the University of Houston System, and Dr. Ed Brandt, vice chancellor for health affairs of The University of Texas System, to make a comment regarding health education and issues there. While I am pleased to have the opportunity to participate in this meeting of the Board as it considers the issues we will face in the 1980s, I am fearful that I cannot adequately reflect to you the opinions of all my colleagues in the council. This is a very real concern on my part because there are 39 members of the council representing the diverse educational systems and academic senior institutions established and supported by the State of Texas.

Higher education in Texas, as you well know, includes institutions that range from the special purpose Texas A&M University Moody College at Galveston and the University of Houston's Center at Victoria, with approximately 700 students each, to The University of Texas at Austin with over 44,000 students. The institutions' role and scope, programs and organization differ widely from campus to campus. Collectively they represent a significant investment and asset of the state.

The future of these institutions is, I suggest, as varied as the institutions themselves. The Carnegie Council on Policy Studies in Higher Education recently published a report on the next 20 years of higher education in the United States, entitled Three Thousand Futures.[1] A comparable study for public higher education in Texas, which would define the possible parameters of the future and identify the problems that will likely be encountered, would be entitled "Thirty-four Futures." My reference to the Carnegie study is intended to underscore our variety, our differing level of programs, our differing involvement and capability in research and public service, including continuing education, and our differing status regarding physical facilities. The future will not and should not be identical for each of these 34 institutions.

Our future, like our past, will result from the interplay of external forces, over which we have limited or no control, and internal choices and decisions which we shall make. Some of the external forces are not clearly

---

* William R. Johnson is president of Stephen F. Austin State University. This statement was presented to the Coordinating Board June 19, 1980, in Arlington on behalf of the Council of Presidents of the Public Senior Colleges and Universities of Texas. He is chairman of the council.

defined at this time. I refer to such elusive factors as inflation rates, recession or depression, escalating energy costs, registration for the draft and shifting patterns of federal financial aid for students. The decisions that we make regarding academic programs, academic standards, the recruitment of students, the level and focus of research, capital expenditures, instructional methods, faculty development programs, compensation for faculty and other employees, management style and techniques and university governance will affect our future and the educational programs we provide to our students. Thus, we on the campuses, in the systems offices, you as members of the Coordinating Board, the Legislature and the Governor of the state inescapably will share the responsibilities and opportunities of the educational future of Texas.

If we are to affect the long-term best interest of the state and our students, we should have as much information as can practicably be obtained about our current status; fix in our collective minds where and what we would like to be five, 10 or 20 years from now; and develop methods and procedures for achieving our objectives.

Our goal for the next 10 years, many have said, including members of this Board, should be the enhancement of the quality of our institutions. How is quality in a diverse setting to be defined? What standards will be applied to measure performance against the stated mission of the institution? Surely quality should relate to students, programs, faculty performance, administrative performance, library holdings and physical facilities.

With such thoughts in mind, my statement will be presented as comments on our current status, including the major issues we are confronting and which in turn will require decisions in the future.

The Students

You have had, and will have updated for you, enrollment projections. I would like to comment on some that I have seen. On a national basis, they range from drastic to moderate declines. The Carnegie report, analyzing several factors that might substantially affect enrollment, projected a national decline of 15 percent ending in 1997, the anticipated low point for undergraduate enrollments. It is expected that the decline will be in two phases. The first will be in the period from 1982 to 1988 and the second from 1991 to 1997. Graduate enrollments are predicted to increase slightly over this entire period.

For Texas, every projection that I have seen expects a more favorable enrollment pattern. The Carnegie report, for example, indicates that in the period of 1980 to 1995 Texas will have better than average enrollment trends, largely because the decline in the 15-to 24-year-old population will be only about four percent. Moreover, in-migration will be a positive factor.[2]

A joint publication of the Western Interstate Commission for Higher Education, the National Institute of Independent Colleges and Universities and the Teachers Insurance and Annuity Association, entitled High School Graduates: Projections for the Fifty States, published in November 1979,

indicates fluctuation in high school graduates in Texas over the next 25 years, beginning with 171,000 in 1979, increasing to 173,000 in 1980, dropping to 158,882 in 1985, rebounding to 184,000 in 1989, decreasing again to 172,000 in 1991 and then increasing once more to 188,000 in 1995. Over the total period from 1979 to 1995 the prediction is for a net increase of high school graduates in Texas of 17,196, or about 10 percent of the current base.[3] Keep in mind that during the recent past a growing percentage of students are attending two-year colleges as compared to senior institutions. Likewise, the students increasingly favor public institutions over private.

The Coordinating Board's enrollment projection of 1978 through 1987, you will recall, indicated an increase of 12 percent in public senior college enrollment--but that figure is now being revised downward. It seems our enrollment will not increase in Texas as it has in the past, but projections by reliable sources for Texas are not exactly bleak.

Whatever the actual figures prove to be, some of our institutions shall increase, some remain essentially constant and some will decline. Each condition contains its own set of challenges. Those that experience decline will need careful study and understanding. Under our formula system, reduced enrollments result in reduced appropriations. Presidents at all institutions, especially those at institutions with constant or declining enrollments, must be determined to achieve more effective use of resources and concurrently avoid contractual and legal difficulties. This is not an easy task, realizing that enrollment declines within the institution are not uniform and resources must be carefully reallocated. For example, enrollments in business administration increase and legitimate needs arise for additional faculty, while liberal arts enrollments decline and fewer faculty are needed--but the shift takes time. Reduced enrollment spreads fixed costs among a smaller group of students, yet quick adjustments in the student-teacher ratio are difficult because of tenure.

Specifically, I mean the adjustments that have been necessary have not been in the magnitude that could invoke the financial exigency clauses of tenure policies. The impact of steady-state or declining financial resources makes the introduction of instructional innovation and/or new programs equally difficult. Marginal and unproductive programs will have to be phased out if the institutions so affected will have any flexibility at all. Reduction of faculty and staff in proportion to the enrollment decline is necessary if faculty are to receive the legislated salary increases, but has an adverse effect upon institutional morale that is difficult to measure. Anxiety levels increase significantly as faculty begin to speculate on where and when the next cuts will come. Steady-state financing also causes unhealthy competition for students between departments, and the resistance against beneficial interdisciplinary efforts is strong. Affirmative action goals become even more difficult to achieve in a period of retrenchment. Our formulas have worked reasonably well in times of expansion; their effectiveness in times of no growth is now being tested.

Several other comments may be made concerning the nature of our student bodies in the next several years.[4]

1. The percentage of women to men students has been and will likely continue increasing. Women students are in the majority on some campuses now.

2. The percentage of minority students, both black and Mexican-American, will increase.

3. There will likely be an increase in the retention rate of undergraduate students. Nationally, retention rates are improving. As institutions strive for enrollment, extraordinary efforts will be made to retain students. This will certainly include improved academic, occupational and personal counseling. Perhaps it will also include special financial aid programs. We must be careful that it does not also include the relaxation of academic standards.

4. The current trend of increasing numbers of part-time students will continue. Similarly, enrollments will likely increase at the large, urban universities.

5. We are apparently experiencing a phenomenon of increasing numbers of students transferring from institution to institution for a variety of reasons. The implications of this trend will need to be studied.

6. Recent legislative efforts to transfer a greater percentage of educational cost of foreign students to those students, if pursued further, may well reduce significantly the number of foreign students attending Texas institutions. Foreign students do bring a different cultural background to our universities and return to their homes with a more sophisticated understanding of the United States. But it cannot be easily argued that their costs should be comparable to that of resident students.

7. During the past several years the abilities of students entering colleges and universities, as measured by entrance examinations, have declined nationally. The decline in scores on the Scholastic Aptitude Test is reported for the period of 1963 to 1979 as 11 percent for verbal skills and seven percent for quantitative skills. The situation might well become more significant as the percentage of minority students enrolling in college increases. Texas universities should do something about an improvement:

   a. Improve the qualifications of graduates of teacher education programs;

   b. Work with public schools to assist in improvements at that level; and

   c. Offer more remedial instruction.

8. There has been a significant shift of students into professional and vocational studies. The colleges and schools of business administration are booming on all of our campuses. Such changing enrollment patterns indicate that not only must we respond to student choices, but we must also give special attention to our general education programs. Studies in the arts, humanities and social studies must remain strong and a significant part of each student's curriculum. There should be an appropriate balance between professional, general education and elective courses.

9. One of the significant strengths of higher education in Texas is our condition of open access through low costs. We should strive to maintain tuition and fees as low as is consistent with economic necessity so that open access will continue to be characteristic of higher education in Texas.

10. Some individuals have expressed concern over possible recruiting practices of universities as the number of students drops. They see a relaxation of standards to a degree that the integrity of the institution might be questionable. Such things as reduced admission standards, reduced academic requirements, hucksterism and false promises in recruiting and low quality off-campus programs are predicted. I trust this will not occur in Texas. We should guard against it. The result would be a loss of institutional integrity and a loss of public confidence in higher education.

The Faculties

Our effectiveness as universities is directly related to the effectiveness of our faculties as teachers and researchers, their knowledge, abilities and attitudes. Our faculties are one of our strengths.

During the recent past several trends have been present that have affected faculty members. With enrollment tending to stabilize, new hires have decreased substantially at most of our universities. The rate is different at various institutions, but faculty mobility has certainly declined. Faculties are already more stable. Generally, the percentage of older faculty members, who have earned tenure, is rising and the percentage of younger faculty is going down. This has several implications. An older faculty is more expensive, even though promotions will have slowed, which causes some faculty frustration. In addition, I believe an older faculty tends to be less innovative, less willing to adjust to changing and new instructional techniques. On the other hand, a stable faculty has some advantages. The faculty will likely be more concerned with the welfare of an institution they are tied to by years of service.

As a result of these trends, I believe new and serious consideration should be given to a faculty development program that would be targeted at specific goals. The legislature has demonstrated its unwillingness to provide traditional sabbatical leaves, leaves that are unstructured except by

the faculty member. In the future there will be an increasing need for faculty enhancement targeted specifically at the acquisition of a new knowledge base or the enhancement of instructional skills. The need may vary from campus to campus depending upon the specific faculty profile present and changing needs. Perhaps we need a faculty exchange program within Texas that would enable institutions to exchange selected faculty members for an academic year, which would encourage faculty renewal. The lack of a faculty enhancement program, I believe, is a weakness of higher education in our state.

Consideration should be given to greater flexibility in providing early retirement for faculty. Specifically, with the mandatory retirement age at 70, and with the necessity of some of us to reduce faculty, thought has been given to ways of making early retirement more attractive. Providing part-time employment during retirement has been one way of encouraging early retirement. The institution retains the faculty member part-time and, since he or she ordinarily has a high salary, is able to employ a younger faculty member full-time on the salary not used by the senior faculty member. Greater flexibility in differing retirement patterns should be provided to enhance the teaching forces at our institutions.

In differing degree, relating to the role and scope of our institutions, higher education accepts as a basic function of our faculty the performance of research, both basic and applied. Our nation, since the earlier years of the 20th century, has gained a position of preeminence in the world of scientific research. The fruits of research conducted on university campuses have been vital to the well being of our nation and state. Several of our institutions have substantial and significant research programs in existence. Research is accomplished in a variety of ways. It is conducted independently by the individual faculty member, sometimes funded and sometimes supported by the faculty member. It also is conducted in organized bureaus, centers or institutes.

Research support comes primarily from federal agencies, the state, industry and private foundations. The establishment and maintenance of research capabilities will certainly be vital in the next period of our history. Moreover, research within the university environment, especially in the major research institution, in the long run is more effective than in the government agency or industrial laboratory. Among other things, the university can bring to bear the talents of faculty across several fields of study on the same campus; the university is training new scientists within the context of on-going research programs; and the university conducts research within the context of competition for funds by faculty, both for institutionally or state-funded and externally funded research. Faculty research proposals are judged by other researchers, causing the better proposals to be funded. In our graduate programs, students are instructed within an environment of inquiry and learn how to conduct research. Universities develop, within their students, the capability to do research.[5] Although there are significant differences among institutions in the level of research activity occurring, some research should be present at every institution. Even in the smallest, in which the teaching program is clearly paramount, the research attitude should be present.

Promoting research on the campuses of our universities is in the best interest of the state. Your recommendation concerning the funding of organized research for the next biennium is appreciated. The level of state support for research will be an important reoccurring issue during the next 10 or 20 years. We are not recommending a blank check for research, nor do we expect resources for which we will not be accountable.

Finally, with regard to faculty, on behalf of the council I should like to endorse your salary recommendations for the next biennium. A recent Coordinating Board news release underlines the truth of what we have seen on our campuses: that during the past 10 years faculty members of Texas institutions have lost approximately 15 percent of their purchasing power. The report issued by the Coordinating Board, entitled Lost in the Index, indicates that an increase of 17.4 percent is needed to restore buying power to the level of 1969. I cannot forecast the economy during the next 10 years. But I can tell you that adequate compensation for faculty and support personnel is important to quality education. Maintaining appropriate compensation should be a matter of continuing concern as it has been in the past.

The Administrations

By and large the institutions of higher education in Texas appear to me to be well administered, and I include in this comment both the policy-making bodies and the administrators charged with the responsibility of implementing policy.

What elements are involved in measuring the quality of administration in our universities? I would suggest that the proper measure of management--or administration--is how well it carries forward the mission or purpose of the educational enterprise. The management system should carry out the functions and achieve the purposes of the organization, and at a reasonable cost. The university exists to develop the human and intellectual resources of our society. Our purpose is to produce knowledge, to educate our citizens. It is self-evident that knowledge is superior to ignorance, and individuals who can communicate, reason, calculate, analyze and create, and who possess vocational and technical skills are important to our society. This is why tax dollars are appropriated for education. Universities should not waste resources in carrying out their social purposes; but qualitative judgments are necessary, not just quantitative, in measuring how well higher education is performing.

Therefore, I would suggest that there is no acceptable technique and set of measurements for analyzing the performance and results of higher education in our state or any other of which I am aware. The development of procedures for measuring outcomes--outcomes--of academic programs should have a high priority during the next decade. Such measures are needed to balance the cost-effective measurements already in place or which are being developed. Low cost academic and vocational programs are not effective if academic standards are low and instruction is inferior.

We need to strengthen management techniques for all of higher education and all levels of management. Whether improved management comes

through techniques such as management-by-objectives or through some other method, goal-oriented leadership is very necessary It is present today in more cases than you would suspect. However, management can be strengthened through systematic efforts. The current opportunities provided by The University of Texas System Institute of Higher Education Management are noteworthy, as is the summer program conducted by Texas A&M University. Such efforts should be expanded in the next 10 years. We need more effective means of identifying potential managers and providing them with the training necessary to be capable managers.

The era of accountability in higher education, while undoubtedly beneficial to higher education, has resulted in extensive time and energy being devoted to responding to an increasing number of demands for information and reports. The University of Texas at Austin recently counted the number of reports per year it submits to state, federal, municipal and private agencies and found that number to be almost 20,000, excluding reports on grants and contracts and verification of student financial aid applications. Certainly this is more than most of us are submitting, but perhaps we have gone too far. A good part of the increased cost of administration relates to reports to other agencies, which diverts resources away from the educational activities of the institution. Moreover, the tendency of expanding external controls results in a corresponding tendency, I believe, toward standardization of institutions. I do not believe that greater standardization is a strength that promotes quality. Accountability needs to be maintained in an environment that minimizes reporting requirements and permits institutional diversity.

The challenges of the next 10 or 15 years will require strong leadership from institutional heads. The problems we shall face, and that some face already, do not have easy solutions. Particularly, we must find and promote methods for institutional progress outside of the environment of rapid growth. The choices made by boards and presidents are never universally popular with all the constituencies of a university; they will be even less so in the next period of our history. But, we must be leaders, not simply survivors, and the support of boards for leaders is essential. We are tempted to avoid long-term problems or meet them with short-term solutions that are expedient and which do not arouse this or that group. Obviously, such response to the issues we face does not serve the long-term interest of higher education, nor does it reflect leadership.

Facilities

We have heard and said a great many things about physical facilities in the past several years. We have talked about the need of higher education for a source of funding for new buildings and major repair and renovation for aging buildings. We have discussed the procedures used by the Coordinating Board in reviewing institutional requests for approval of construction projects. This entire issue is one of the pressing matters we face as we enter the 1980s. I think it is time for all involved to step back and review the issue as objectively as we can, keeping in mind our basic purposes. I hope that we agree on the very basic issues, which are:

1. There will be significantly less need for new construction in the next 10 years than in the last. However, the need for some new facilities exists on many campuses.

2. There will be a growing need for major repair and renovation funding as buildings age.

3. The increasing costs of operation, in particular, utilities, in old and new buildings is a major concern. A greater and greater portion of the educational dollar is being consumed by utility costs. Finding more effective ways of reducing energy consumption is certainly an item with high priority.

Beyond these basic matters, there is undoubtedly difference of opinion concerning our appropriate course of action. The Council of Presidents does believe that all universities should have access to a dedicated fund for capital expenditures (not only those that benefit from the Permanent University Fund) and that the distribution of such funds should be equitable and made to meet real needs. We believe that expenditures should be the result of long-term planning. We disagree on estimates of the funds that will be necessary over the next 10 years. We need to find a method of determining, certifying, if you will, institutional needs that satisfies all parties involved--the institutions and their boards of regents, the Coordinating Board, the Legislature and the Governor. We stand ready to work to achieve a better way. In any case, this is a major issue that we are carrying into the 1980s unresolved.

Another matter, related to facilities and instruction, that will be of growing importance in the 1980s is instructional capital equipment. Instructional equipment for all disciplines is increasingly expensive, but especially in the sciences, including agriculture and engineering. In the recent past, federal grants provided for the acquisition of equipment for instruction and research, supplementing state resources. With federal sources diminishing, institutions must insure that instructional equipment is neither obsolescent nor unusable because of excessive wear. Effective instruction in technically oriented programs is very dependent on modern equipment.

Planning for the Future

Our planning for the next several years should be directed toward finding ways of improving the quality of teaching, research and service. Each institution should have this goal. Planning with regard to most of the basic elements of quality performance will have to occur at the institutional level. Yet many of the issues that we face require statewide action as well as institutional choices. Thus, planning for the future, where appropriate, should be a joint effort between institutions and state-level officials.

Planning needs to be done on a base of longer than two years. Goals relating to the quality of our institutions should be set within a time period of 10 or 15 years, with provision for periodic review and updating.

Perhaps we should study again the central governance of higher education, considering what is best done at the campus level, subject to the approval of boards of regents, and what needs to be done on the state level and subject to your approval and/or legislative agencies. We should develop general goals that relate to the quality of our institutions in several categories that I have already spoken to: resources (including financial, faculty, equipment, libraries, etc.), students and academic programs. All of our goals must be cost effective. We need to develop first the process of planning that joins your staff more effectively with institutional resources together in a common planning effort where it is appropriate and necessary. In this way we might address some of our weaknesses and build upon our strengths.

Conclusion

We have now entered the decade of the 1980s. Our challenges will be significant, more complex than any time, I think, in the past 40 years, but not awesome or overwhelming. Every period in American education has had its special tasks. Those which we are anticipating can be dealt with effectively.

Indeed, as we compare our state to other states, and our institutions to theirs, this decade presents the opportunity to move ahead--not in opulent splendor of over-built staffs and facilities--but in advancement of the fundamental quality of educational programs, delivery systems, up-to-date support facilities, truly needed public services and meaningful research. Nothing is calculated to advance Texas in the long run more than the prudent advancement of its educational programs at all levels. Our institutions, I think, are effectively serving our students and the state. Through the primary efforts of our faculties, the leadership at the campus level, wise coordination and support and positive legislative support, as well as regulation, we can become much better, achieving goals based on quality, in the next decade.

Thank you.

NOTES

[1]The Carnegie Council on Policy Studies in Higher Education, Three Thousand Futures: The Next Twenty Years for Higher Education (San Francisco, 1980).

[2]Ibid., pp. 37-50, 69.

[3]Western Interstate Commission for Higher Education, High School Graduates: Projections for the Fifty States (Boulder, 1979), p. 30.

[4]See Three Thousand Futures, pp. 29, 42-44, 98-100.

[5]Ibid., pp. 111-112.

ISSUES INFLUENCING THE FUTURE OF URBAN INSTITUTIONS OF HIGHER EDUCATION

by Charles E. Bishop*

Madam Chairman, members of the Coordinating Board, I welcome this opportunity to discuss with you several issues which I believe will significantly influence the future of our urban institutions of higher education and which will create special needs that must be met during the 1980s. It is my belief that this decade and the next will be the most dynamic and challenging for our country that any of us have experienced. Indeed, there is among us an increasing conviction that one era in our history is drawing to a close, and a new one, for which we are unprepared, is rapidly approaching.

As we look to the future, there are four conditions which warrant our special consideration. First the economic structure of our country and of other nations is shifting dramatically, and the United States' comparative advantage in world economic markets is declining. The pervasive spread of improved technology to other countries has greatly increased their productivity, and the world no longer looks to the United States as the dominant source of strength in the world economy.

Second, the known supplies of strategic natural resources are dwindling, and ownership of these resources is becoming more concentrated, thereby creating further shifts in economic power.

Third, as the economic power base shifts, new political alliances among nations are being forged which are altering dramatically our relationships with other nations.

Fourth, as a result of the above changes, we now find ourselves conducting economic, political and military negotiations with nations about whom we know and understand relatively little. In particular, there is an appalling lack of understanding and appreciation in America of the cultural differences among people and nations and how these differences affect our political and economic future.

The changes which I have outlined above have had, and will continue to have, special impacts upon metropolitan areas in Texas, including Austin, Dallas, Fort Worth, Houston and San Antonio. These metropolitan centers are the areas of greatest concentration of industry. Any alteration in the comparative advantage of U.S. industry has significant impact upon them. They also are the areas that are most vulnerable to changes in natural resource supplies.

---

* Charles E. Bishop is president of the University of Houston System. This statement was presented to the Coordinating Board June 19, 1980, in Arlington in conjunction with other testimony on behalf of the Council of Presidents of the Public Senior Colleges and Universities of Texas.

These metropolitan areas are the major centers of state, national and international governmental activity. Therefore, they also are the areas of greatest cultural diversity. Since the major metropolitan areas are affected most by the changes now taking place in the world, they also are the areas which are likely to benefit most from expanding knowledge through research.

Of particular relevance to us today is the fact that recent studies indicate clearly that the large institutions of higher education in metropolitan areas are accounting for an increasing proportion of the enrollment in higher education. These institutions, therefore, have a special challenge in serving our nation during the years ahead.

Reindustrialization of America is being discussed widely as a means of arresting the deterioration in the nation's strength. In the June 13 issue of the Wall Street Journal, Peter Drucker presented a succinct argument supporting this position. He argued that structural changes are taking place so rapidly in the developing countries that it is futile for the United States to attempt restoration of international competition as a producer and exporter of goods manufactured through traditional blue-collar employment. In his view, the second demographic transition which is now occurring is moving labor massively out of manual work and into "knowledge work." He argues that in order to maintain the competitive strength and leadership of America it will be necessary to shift manufacturing work from operating machines to programming machines and programming lines. He concludes that the shift to knowledge-based manufacturing is the only way to expand employment in this country without worsening inflation and that we must encourage automation and the shift of blue-collar workers to white-coated technicians.

There are many important implications of such rapidly changing conditions for higher education. Clearly, our institutions of higher education must provide the basic and applied research and the skilled manpower that are necessary to effect such a transition. We shall also face new challenges in providing students with the capacity for insight and perspective for life in the dynamic and uncertain world that we face. If these goals are to be attained, we need your support and encouragement in four key areas.

First, it is imperative that we maintain the capacity and freedom to modernize our programs of instruction and to keep them current. We must have highly qualified faculty and staff, modern classrooms, laboratories and equipment and an innovative spirit.

Second, the costs of education are becoming prohibitive in terms of the income foregone and in terms of the cash outlays that are required to attain access. If America is to maintain its commitment to making higher education available to the masses, it will be necessary to develop new and more efficient means of providing access. The use of more efficient means must be encouraged and rewarded.

Third, if we are to expand and maintain our competitive position in knowledge work, we must place greater emphasis upon research. Indeed, it

is from the research base of our universities that the knowledge to cope with the challenges of the 1980s and 1990s will come. American universities produce one-half of the fundamental research and more than one-half of the applied research in this country. If we are to expand research output, we must increase the productivity of our scientists. This will be accomplished only if we are prepared to slash the red tape that now entangles them and establish a reward system which, in the words of the president of the National Academy of Sciences, enables our scientists to get off of their knees and on their toes.

Fourth, the changing conditions which we are likely to face during this decade and the next will require that we develop a closer liaison between the institutions of higher education and government and between the institutions of higher education and the private sector. We must encourage innovation in this area as we seek to develop the same kind of coordination among these vital segments of our society that has been established in Japan, West Germany and other highly developed countries.

I believe in the 1980s and 1990s higher education will assume a role of unparalleled significance. The dynamic and uncertain nature of our world will require that our institutions be flexible, innovative and responsive to local, state, national and world conditions. It is imperative that we cultivate an environment which will enhance the creativity of our institutions of higher education. We shall need your assistance as we endeavor to do so.

Thank you.

HEALTH PROFESSIONAL EDUCATION IN THE 1980s

by Edward N. Brandt, Jr., M.D.*

Madam Chairman and members of the Board, I am Dr. Ed Brandt, vice chancellor for health affairs of The University of Texas System and chairman of the Governor's Medical Education Management Effectiveness Council. I am pleased to be able to present some thoughts about health professional education in the 1980s. Since I am most familiar with the schools in The University of Texas System, most of my remarks will apply to them.

Three major factors must be considered in the 1980s. The first is the necessity for Texas to educate enough health professionals to meet the needs of the people of Texas. Second, the education must be of a quality sufficient to insure the best possible health care for the people. Finally, the cost of this education must be as low as possible but not so low as to jeopardize the quality. Before discussing each of these factors, let me present some general principles, essential to understanding health professional education. First, the education of health professionals must take place in a clinical patient care setting. Therefore, clinical facilities are essential, but the addition of students to a hospital or other patient-care facility increases the costs of that facility because of the necessity for maintaining teaching space, increased staff requested and other variables. Since the state owns only one of the primary teaching hospitals, these increased costs are borne by the local taxpayer or the patients. Second, all health professional schools take their tripartite mission of education, research and patient care seriously. Indeed, in 1979, the faculties of the seven state-owned medical schools were responsible for over 200,000 hospital admissions. These patient admissions accounted for 1.7 million patient days and 1.8 million outpatient visits. Note the number of people who benefited from the efforts of these facilities. Furthermore, the state-owned health professional institutions (that also includes The UT Cancer Center and the Tyler Health Center) had research expenditures in 1979 of over $84 million, but the state invested only $15.3 million in direct appropriations. Hence, the people of Texas benefited two ways: from the advances in medical care gained from the research and from the benefits of adding nearly $70 million to the state's economy. Furthermore, research is essential to good teaching. The greatest danger to good education is an effective teacher who teaches misinformation.

The two considerations I have just discussed, patient care and research, make the problem of determining educational costs nearly impossible, since it becomes dependent entirely upon someone's view as how to allocate those expenditures. One cannot clearly separate the costs of education, patient care and research since the functions are so completely intertwined.

---

* Edward N. Brandt, Jr., M.D., is vice chancellor for health affairs for The University of Texas System. This statement was presented to the Coordinating Board June 19, 1980, in Arlington in connection with other testimony on behalf of the Council of Presidents of the Public Senior Colleges and Universities of Texas.

Let us now examine the issue of the numbers of health professionals. The state should support health professional education to the extent that the demands for health care of the people are met. The Medical Education Management Effectiveness Council, appointed by the Governor, believes that the planned first-year enrollment in the eight medical schools of 1,245 is appropriate. This will allow us to reach the goal set forth in the 1974 Coordinating Board report of 180 physicians per 100,000 population by the year 2000. I might add that this goal, which is based upon workload of physicians, is also advocated by the American Medical Association and the federal government. We are convinced that the projected enrollment for medical schools is correct.

Dental enrollment is not so simple. In Texas, large areas with naturally fluoridated water and improved treatment techniques have led to a decreased number of dentists needed per unit of population. Yet there are large numbers of people not receiving dental care and the population of Texas is projected to increase by 50 percent by the year 2000. The major factor is ability to pay for dental care. Since federal and other programs do not include routine dental care presently but probably will in the near future, the current enrollment is appropriate and should be sustained.

We have a severe, indeed critical, shortage of nurses in this state. The University of Texas operates three major hospitals, and in every one of them we have units closed because of the shortage of nurses, yet our enrollment statewide has decreased. The turnover rate of nurses remains high and, in my view, will continue to be so. The only feasible educational alternative is to keep the enrollment high and work to stimulate young people to enter nursing careers. In the interim, employers, particularly in hospitals, must develop programs aimed at increasing retention such as alternative approaches to work shifts and assignments.

Demand for allied health personnel throughout the state is high and will continue to be so because of the advances in technology. The recommendation of the Sprague Committee will be of great value in planning for the future.

As to cost, please remember that medical education in Texas is funded in a combined fashion; that is, the costs of education, patient services and research are included in one appropriation, and not all of the funding is from the state. Certainly, that is the most efficient and effective way; however, it does give a false impression by implying that all of the state-appropriated funds are for education. For example, in the 1979-80 appropriations for UT institutions, $69.7 million was the net amount (that is state appropriations less income for patients) appropriated directly for patient care, and this figure does not include indirect costs such as utilities, general administration and faculty supervision. It is often asserted that health professional education is expensive, and it certainly does cost more than liberal arts or legal education; but I know of no evidence that the funds are not spent effectively and efficiently at least by The University of Texas System. Furthermore, an adequate supply of well educated effective health professionals is essential to the quality of life in Texas, and we must be prepared to meet the costs necessary for that.

Quality of educational programs is like beauty, in that it is in the eyes of the beholder. However, there are several overall measures, such as licensure examinations. The Texas State Board of Medical Examiners utilizes a national examination known as FLEX. During 1973-77, 5,124 physicians took that examination in Texas; and 3,493 or two-thirds were graduates of Texas schools. Ninety-five percent of Texas graduates passed, compared to 89 percent of graduates of other U.S. schools and only 63 percent of foreign graduates. I am advised by the board that in 1978 and 1979, persons taking the exam in Texas (most of whom are graduates of Texas schools) had the highest scores and the lowest number of failures of any state in the United States. In dentistry and baccalaureate nursing programs, we see similar results. There are other measures of quality that could be reported, but the evidence is clear that the bulk of the health professional programs in this state are of high quality and are meeting their responsibilities to the citizens of Texas.

In the eighties, there must be maintenance of the enrollments in medicine and dentistry with expansion of graduate medical and dental programs and of nursing and allied health. Greater emphasis must be placed on continuing education of all health professionals. I see further increases in quality to be accomplished through further faculty development and better prepared students entering our programs. I believe that you can be assured that our faculties and our graduates are competent and dedicated and the people of Texas will receive the best possible health care in the future if we can maintain and continue to meet our enrollment figures and the funding levels required.

Thank you very much.

COMMUNITY COLLEGE FUNDING CONCERNS

by Jean Richardson*

Introduction

The Coordinating Board is to be commended for taking a long look into the future of higher education in Texas. You have our thanks for listening to us and the many other persons who will appear before you.

The document titled "Lost in the Index", which was received after my remarks were prepared, is an important and useful contribution to a better understanding of some of the problems with which we are concerned. While this study does not include data from public community colleges, the conclusions are applicable to them. The Coordinating Board is to be commended for having commissioned this study.

Community College Funding Concerns

It is unfortunate that so much attention must be given to existing and projected problems associated with the funding of public community colleges, but there is no avoiding the fact that adequate and equitable funding is essential to the continuation of quality education and service by community colleges.

The elements which will be the source of future funding problems are already present; continuation of these problem elements seems assured. Some of these problem elements are shared with other components of higher education and with society as a whole. Some are of special, if not unique, concern to public community colleges.

In the statements which follow there is no effort to provide voluminous statistics or other data in support of the positions stated. The problems reviewed are familiar ones and do not require such support. In addition, the volatility of some information -- such as inflation rates -- is such that exact figures are quickly out of date.

1. Enrollment Trends and Patterns

Only a few years ago the art of college enrollment forecasting could be performed with confidence and amazing accuracy of result. Errors, if any, were on the low side of the target.

It is now more common to project stability or decline of enrollment. The reasons for such projections will not be debated nor will the general

---

* Jean Richardson is president of Del Mar College. This statement was presented to the Coordinating Board June 19, 1980, in Arlington in conjunction with other testimony on behalf of the Texas Public Community/Junior College Association. Richardson is chairman of the TPCJCA finance committee.

validity of the resulting conclusions. What does justify concern is the exception to the general projections and conclusions.

The 1979 Annual Report of the Coordinating Board shows that enrollment for Fall 1978 compared with Fall 1977 increased 5.24 percent in community colleges, while the change for senior colleges and universities was 1.60 percent. The figures will vary for later years, but the point should be made that valid enrollment projections for higher education as a whole become less certain when extended to public community colleges and may be invalid when extended to any one of the 60 community college campuses in Texas.

A few of the larger urban area community colleges will continue to experience significant growth into the future. Some of the smaller institutions will experience growth in response to changes in specifically local circumstances. Population, industrial and business shifts associated with the Sunbelt phenomenon will not be confined to large urban areas.

Growth, while welcome, creates funding problems. The "pay as you go" fiscal philosophy of Texas state government is not paralleled by a "pay as you grow" funding system for public community colleges. The whole funding process, even including local tax support, is essentially after-the-fact. Enrollment growth creates pressures of quantity on quality.

Enrollment change need not be large to create funding concerns. Initiation of new programs in response to the needs of the business, industrial and health-care sectors of a community may affect enrollment little but funding problems greatly. The start-up costs of equipment and personnel for most occupationally oriented programs are heavy. Funding is, once again, after-the-fact. If the needs of our economy are to be served, new programs must be provided.

What of shrinkage of enrollment? Wise governing boards and administrators have already planned methods of retrenchment and reduction-in-force. Even so, there are rigidities in the cost structure of colleges which do not permit instantaneous cost-reductions. If a dip in enrollment occurs at the wrong time -- a "base year" in funding calculation -- and is temporary in nature, the effects will be felt for two years.

There are no adequate buffers against this problem.

It is worth noting that the Legislature acted wisely and properly in 1979 by appropriating special funds to assist eight public four-year institutions which had experienced enrollment decline. It is an understandable concern of public community colleges that the funding process does not provide a means for similar protection in similar circumstances.

Summary

Some Texas community colleges will continue to grow; funding for growth is after-the-fact. Some community colleges will experience new program demands; funding for new programs is after-the-fact. Some community colleges will have decline in enrollment; the funding process may not provide buffers for this problem.

2. Formula Rates and Inflation

The formula funding system in use for public community colleges is criticized by many persons but few, if any, offer viable suggestions for improvement. Among the community college sector there is no apparent widespread desire to shift to some other system of allocation of funds.

Acceptance of the system does not mean that there are not problems in its application which are likely to become more pressing in the future.

Stated in over-simplified terms, formula rates are determined by calculating the cost of instruction for one student contact hour in each of several disciplines in each community college offering such instruction. The cost figures are arrayed from highest to lowest, and the figure halfway from bottom to top (the median) is the basis for the formula rate for all the colleges. These rates are then multiplied times the student contact hours of instruction during the "base period" to determine the appropriation request for each college.

What are the problems involved?

(a) The formula rates are historic information by the time they are applied. Appropriations requests to be submitted to the Legislature in 1981 are based on costs during the 12-month period ending August, 1979. By the effective date for appropriations the cost information in two years old.

Cost figures are adjusted upward by inflation factors intended to bring the formula figures in line with current experience at the time appropriations are enacted. Unfortunately, the Legislature has consistently appropriated amounts well below the recommended and/or actual inflation factors.

(b) Designation of the median figure as the basis for formula rates is an arbitrary decision. The process is totally mathematical, measuring only what is, and does not allow for judgment as to what is desirable. At no stage in the process is there any consideration of the figure necessary to contribute to quality of result. The median may be higher than is necessary to conduct good quality instruction, or it may be lower than necessary.

Summary

The formula funding process used for community colleges is basically satisfactory but, as implemented, is keyed to past costs and inadequately reflects cost changes.

Tying formula rates to median cost is too inflexible and gives no consideration to judgments concerning quality.

3. Faculty Salaries

Colleges are labor-intensive enterprises. More than any other factor,

faculty members influence the results of the efforts devoted to education.

Teaching is a highly personalized activity. While enthusiasm and high morale on the part of faculty members do not guarantee excellent teaching, indifference and low morale are major contributors to poor teaching.

Teachers are seldom totally salary motivated, but there is no question that salary considerations have become increasingly important in our inflation-dominated economy.

Community colleges are teaching institutions. The necessity and importance of other activities such as research and publication are not questioned, but these matters are not a part of the role of community colleges. Teaching is the role and the commitment.

Among many of our community colleges there is serious and real concern as to their financial ability to provide adequate and just salaries in the future.

Summary

Good teaching by fairly compensated teachers is vital to quality education. The limited financial resources of many community colleges raise serious question as to their ability to meet the need for adequate faculty salaries in the future.

4. Energy Costs and General Inflation

The impact of rising energy costs and the debilitating effects of price inflation are experiences shared by our total society. Community colleges are not immune to these problems.

Even with efforts to conserve both energy and dollars, some community colleges are finding that energy costs are rising beyond the ability to meet these costs.

The most recent Annual Report published by the Coordinating Board points out that legislative appropriations for utility costs at public senior colleges in the current biennium are 32 percent over the previous two years.

Utility costs at public community colleges must be met from local resources; state funds cannot be spent for this purpose.

Local financial resources, primarily taxes and student charges, must be used for a variety of purposes, including utility costs. Utility (energy) costs at some community colleges are requiring most, if not all, of the dollars received in local tax income. These dollars are not available for additional support of instructional programs.

Summary

Increasing energy costs and inflated prices in general are consuming increasing amounts of the local income of community colleges and therefore

reduce funds available for the support of instructional programs.

5. Small Colleges and Small Districts

There are two problems related to size which are very troublesome for some of the Texas public community colleges. The first problem concerns colleges with small enrollment and the second concerns colleges with small tax districts.

Smaller institutions such as Clarendon Junior College, Frank Phillips College, Hill Junior College, and perhaps one or two others, earn and receive reasonably small state appropriations. Local financial resources may be inadequate. There are, however, some minimum cost and service levels which exist without regard to size. A library must be provided, counselors must be available, records must be maintained.

These colleges are important segments of higher education in their areas, and it is important that ways be found for them to continue to exist and to undergird their efforts.

A few institutions have very small local tax districts. Laredo Junior College has a district of 13.6 square miles; Texarkana College, a district of 21 square miles. The local tax potential in these districts is obviously very restricted. While it is true that there are statutory processes for expanding district boundaries, the political realities of today show that expansion is very unlikely. Increasing income from local sources is less and less possible for these colleges.

Summary

The small enrollment of a few community colleges creates problems in the relationship between income and fixed costs. The small size of local tax districts of a few colleges imposes serious limitations on local income generation, and the legal processes for enlarging these districts are unlikely to be accomplished successfully.

PUBLIC COMMUNITY COLLEGE PROGRAMS: DEVELOPMENT AND EVOLVEMENT FOR THE '80s

by Robert L. Clinton*

Mrs. Milburn, members of the Coordinating Board: You have just heard a description of the comprehensive community colleges in Texas as well as how these institutions are financed. In the remaining time we have left, I hope to relate to you the reasons why the colleges exist, the programs within these institutions, and how they serve the people. One cannot start without mentioning "accountability." Community colleges are accountable first to the local communities, through a locally-elected board, to the state agencies, and the Legislature, and finally to our students, the consumers.

First, let us start with how a course or program receives approval. In the case of an academic program, each course approved for appropriation purposes shall be similar to a course offered in a Texas four-year, fully state-supported institution of higher learning and shall conform to the same standards. These courses must be found in at least two or more senior institutions at the lower-division level. The course guide manual approved by this board is our guide. Any digression from this rule needs special review and approval.

The community colleges follow the same standards of accreditation through the Southern Association of Colleges and Schools as our senior institutions. In the past decade, the quality of our faculties has increased tremendously. As an example, the academic faculty at Western Texas College includes over forty percent with doctor's degrees and over seventy percent with at least one or more years above the masters. Our faculties are not involved in research, and most are carrying full teaching loads, which, for most community colleges, would be at least fifteen semester hours.

In the case of vocational-technical courses, the approval is somewhat more complicated. Approval of these courses or programs is through the Texas Education Agency, although the Coordinating Board does have input through your joint-committee. Each technical vocational program funded must have prior approval of the TEA. Each program must have an occupational objective. Each program must meet the requirements of the Texas state plan for vocational education. A syllabus for each course has to be approved. All programs having a licensure agency must meet the requirements of that agency as in our nursing programs. Curriculum changes must have approval. All programs are reviewed by the Joint Program Review Committee composed of at least five professional staff members of the TEA and the Coordinating Board. The chief

---

* Robert L. Clinton is president of Western Texas College. This statement was presented to the Coordinating Board June 19, 1980, in Arlington in conjunction with other testimony on behalf of the Texas Public Community/Junior College Association.

executive of the institution or a designated representative is expected to present the proposed new program to the joint committee.

Every dean, guidance counselor and instructor must receive certification from the TEA. There is a requirement of at least three years of wage-earning experience for an instructor in his field of teaching. Each program must have an active advisory committee. These committees are made up of employees and employers from outside the field of education. In the case of automobile mechanics, the advisory committee would include owners of automobile agencies, parts managers, service managers and mechanics. These people provide a link between the community and the college for the purpose of maintaining and improving the program and to help equip students with skills needed to be successful in that particular vocation. They also assist in placing graduates in jobs. There are also apprenticeship programs which send students out into industry for part of their training.

It is the responsibility of TEA to carry on a continuous study of job needs statewide. Every effort is made to avoid costly duplication of programs. When WTC opened in 1971, an application was made to train computer programmers. The application was not approved, because at that time studies showed that there was a surplus of programmers in the state. Since TSTI was offering TV repair in Sweetwater, 38 miles away, we also refrained from asking for a similar program. For the most part, there is excellent cooperation between area community colleges in attempting to avoid duplication where a larger area can be served by one institution. Productivity is the name of the game. A state agency does not have to tell us to phase out a program. When the need drops off, and there are no longer students for that program, there is no choice but to close the program.

Although the TEA attempts to monitor voc-tech programs, community colleges do not need a state agency to demand quality programs. The majority of voc-tech graduates go to work immediately within the community. An employer who pays taxes to an institution is not reluctant to inform the college when that institution produces an inferior product. At this point, the relationship between quality and financing comes into play. The employers want a graduate that has been trained on the latest equipment; therefore, keeping shops up-to-date requires a tremendous amount of money. With the type of financing Texas community colleges received in past years, it has been impossible to keep ahead of new developments. Another major problem is the lack of money for start-up programs. The local district has to finance all new programs, including buildings and equipment. Usually, it takes at least two and sometimes three years before any state money is received, even for instruction.

Texas colleges have an excellent system of program evaluation. Through the TEX-SIS student information system of follow-up, Texas community colleges have a model of institutional program evaluation that is the envy of other states. The major facets of this program include the follow-up of graduates of the colleges, non-returning students, employers of these former students and students who withdrew without completing the semester's work. Persons in adult and continuing education are also polled for their opinions concerning the colleges, their instructors, facilities, services and programs.

Few, if any, of the colleges do all of the evaluations each year, but every community college participates to some extent (based on financial ability). Some funds are provided for follow-up of technical students by allocations in the formula rate for TEA programs, but no such monies are allocated for study of students in university parallel and community service programs. The degree of participation is therefore admirable, since the colleges must pay for this cost in local funds.

Colleges that are using these studies to evaluate curricular programs, instructional programs, services and other facets of the campus environment profit greatly from the comments, both good and bad, from former students. This is one of the standout programs that distinguishes the special role of the community college and the value these colleges place upon the education of the individual.

I will spend very little time on our off-campus operations, except to say that community colleges serve many thousands of persons who would otherwise not have available to them postsecondary education. These programs are approved by this board, after every program has been screened through eight regional councils in the state. Since most community college students commute, it may be found that it is more energy efficient to send one teacher to a class forty miles away than to have thirty students driving to the campus. The energy situation during the next decade will certainly require different approaches to much of our operation.

Another important phase of community college education is that of adult education. Edmund Gleazer, writing in his new book, "Values, Vision and Vitality" of the community college, asks the question, "Would it not be more appropriate, to use the word 'learner' rather that the word 'student' for persons being served?" There are an estimated 64 million adult learners within the United States that are participants in various kinds of post-secondary education. Information supplied by the American Association of Community and Junior Colleges estimates that of the 40 million adults who will be going through a career change in the next 10 years, 24 million will be turning to institutions like the community colleges for training and/or re-training. The majority of these "learners" will be enrolling in non-credit courses. According to a report just released by the National Center for Educational Statistics, the "average" adult learner is 36 years old, has a family and is seeking career or personal enhancement. Texas community colleges are in the forefront of this movement. Two-year colleges now have more institutions offering non-credit activities for adults and more participating adults than any other segment of higher education.

Closely tied to adult education is community colleges' involvement with local industries. The presence of a community college enhances the possibilities of new industries locating nearby. An example of this type of cooperation happened with the Cowden Mfg. Company of Texarkana, Arkansas. The Chamber of Commerce Industrial Committee approached Texarkana Community College to help solve the need for 350 new employees. Through a joint effort of the Arkansas Industrial Commission, Texarkana Community College and the Cowden Company, equipment was put in place and the training was completed. The industrial commission paid for the industrial cost, the college furnished the space and administration, and the Cowden Company furnished the necessary

machines. The follow-up showed the program to be a success.

Motorola, which has just moved into Fort Worth, lists Tarrant County Junior College as one of the big factors in its location in that city. Within the past year, this college has conducted start-up training programs for Conveyor Corporation, Trinity Valley Steel and Graham Magnetics. Classes are beginning this summer at Tarrant County Junior College, as it becomes a major training center for the Lennox Industries, manufacturers of air conditioning equipment.

The Dallas County Community College District trains machinists for Texas Instruments. Begun in 1976, this in-plant program has graduated scores of associate degree machinists to meet the demands of Texas Instruments. In 1979, a fast-paced, entry-level machinist program was developed in which six weeks of full-time campus study is followed by full-time TI employment and continued in-plant training. Both programs grant college credit and can lead to an associate degree.

Dallas has a non-credit program designed to provide in-house training in electronics assembly and safety skills for Teledyne Geotech. The home and apartment builders of metropolitan Dallas contacted the DCCD to establish a joint program for apprenticeship training for residential construction workers.

Time will not permit me to relate to this board the many thousands of programs going on today within our community colleges; however, it should be noted that the community colleges in Texas are providing 95 percent of all the postsecondary technical training in this state.

The community colleges can learn from industry in the various management procedures that industry has proven to be effective. Quality control in education is more difficult to identify and study than in industry; however, cooperation between each can cause a more effective approach to quality control in education.

The State Legislature is continually increasing the requirements of clock-hour instruction for various professions throughout the state. Real estate salesmen, nursing home operators and food handlers are examples of various professions looking to the community college to provide non-credit instructional programs to meet these new certification requirements.

Our older citizens are looking to the community colleges for aid in enhancing their lives. Scurry County has a population of less than 20,000, yet that college has enrolled more than 1,300 people in the senior citizen program with 650 active participants each week. The college has been the catalyst, with the city, county and Governor's Committee on Aging helping to finance the program.

Community service programs are important to local communities, although certainly not the most important part. These programs are self-sustaining and are only organized when an interest or need arises. It would be hard to argue that building facilities that are paid for by local citizens could not be used by those people to enhance their lives, whether it be for physical or mental improvement, hobbies or any other kind of learning activities.

Practically all community colleges provide some type of remedial courses. Adult basic education includes teaching people the English language and remedial reading courses. Why are these programs needed? Mainly because the community college serves the greatest number of people from different generations, ethnic and socioeconomic backgrounds. We are criticized for trying to be all things to all people. Certainly, there have been failures; however, if the needs and expectations of local communities are met, this is another important area to be considered.

Texas community colleges changed greatly during the '70s. What can be expected in the '80s? First, there will be more adults, even though the average student age today is over 28 years. Older people will be served in larger numbers. We will be working more closely with business and industry, and there will be a greater partnership with other community agencies.

There will be more women, more minorities and more handicapped persons being served. Texas community colleges will be successful according to the degree of support received from the State Legislature and especially from this board. The policy of the Coordinating Board from its inception has been the establishment and operation of excellent community colleges. The reason we can make this kind of report today is because of the success of these policies. I know we can look forward to the '80s for even greater success with this board's guidance and continued support.

HIGHER EDUCATION: AN INVESTMENT, NOT A COST*

Our three organizations, representing over 10,000 faculty, librarians and other professional workers in Texas higher education, appreciate this opportunity to present a statement to the Coordinating Board as it considers drafting a long-range plan for higher education in Texas. The next decade will be one of challenge and opportunity, fraught with many difficulties for higher education. In the face of limited resources and stabilizing--or even declining--enrollments at some institutions, close attention must be given to preserving and promoting quality education at all levels and in all aspects of our colleges and universities. Quality higher education is essential in keeping Texans and Texas industry competitive in an age of ever-increasing dependency upon research and specialized knowledge and must not be sacrificed to false concepts of economy or to inapplicable concepts of efficiency. Expenditures for higher education must be viewed as an investment, not a cost; they are an investment in that most valuable and expandable resource which holds the key to the future well being of our society--an educated population.

1. Raising Faculty Compensation

Quality education depends in large measure on the type of faculty attracted to and maintained within the system of higher education. The Coordinating Board needs to secure a much higher level of faculty compensation, particularly in fringe benefits. While faculty salaries in Texas are well behind those in other major states, the lag in fringe benefits (retirement contributions, medical and other insurance programs, sabbatical leaves, etc.) is much greater. Failure to bring dramatic improvement in faculty compensation will allow other states to continue to outdo Texas in attracting high quality faculty members and augment the flood of high quality faculty members leaving education for private and even for other forms of public employment. Raising faculty compensation to the level prevailing in other leading states is the most important action needed to provide Texas the quality of service which it will need in the 1980s from its institutions of higher education.

2. Assuring Balance Between General and Vocational Education

Because higher education in Texas, as elsewhere in the nation, has come to focus narrowly on preparation for a particular vocation, the Coordinating Board must work to assure a proper balance between general and vocational education. Our graduates need to be prepared not only to make a living but also to perform better as marriage partners, parents, transmitters of a cultural heritage, and citizens of local, state and national democracies.

---

* Joint statement of the Texas Association of College Teachers, Texas Junior College Teachers Association and Texas Conference, American Asscciation of University Professors presented by Phil White, president of TACT, to the Coordinating Board June 19, 1980, in Arlington.

3. Developing Adult Continuing Education

The Coordinating Board has a special responsibility to make general education available to thousands of undereducated adults whose earlier preoccupations denied them the opportunity for the personal fulfillment which such an education can provide. In addition, retirees, women returning to the work force, persons needing retraining to meet changed vocational needs, as well as professional people needing continued updating in their field, provide a vast reservoir of educational need. While much of this function should be self-supporting, the Coordinating Board should seek to secure funding for development so that the resources of our colleges and universities may be utilized fully in meeting this challenge.

4. Stimulating Faculty Research and Public Services

Underfunding of research in recent years has contributed to America's productivity problem relative to other industrial nations and threatens to create a similar problem for Texas relative to other industrial states. Underfunding of research also hinders recruitment and retention of high quality faculty in competition with other states. For these reasons the Coordinating Board must make major efforts to increase research funding dramatically in the 1980s. The varied skills of faculty members in higher education in Texas constitute an underutilized resource which could be employed much more productively by both public and nonprofit organizations. We encourage the Coordinating Board to try to help public and nonprofit agencies draw upon faculty skills more fully than they have in the past.

5. Improving Institutional Governance

Dissatisfaction with university governance has been very evident in recent years, in legislative chambers on the one hand, and among faculty and students on the other. To improve the quality, the Coordinating Board should: (1) endeavor to secure the appointment to university governing boards of members who understand and will be responsive to these various constituencies; (2) consider instituting a continuing training program for members of governing boards; (3) require each institution to report fully to the public on all its expenditures from all funds; (4) secure meaningful faculty participation in institutional governance in order to attain both a more responsive administration and a more satisfied faculty; and (5) in view of the difficulty in achieving the previous recommendation, study the effects of unionization of faculty in other states in order that any trend toward unionization in Texas might result in less disruption and fewer unfortunate consequences than have occurred elsewhere.

I would like to extrapolate on that a moment. I think the preference of most all faculty in this state is that there be provision for increased faculty participation in university governance. I think it is very clear that that would really help create more effective administration in the sense that the job of administration is to help the individual--in this case, the faculty member--to do his job better. And who knows better than the faculty member what he needs in order to do his job better? It does

seem to me there is a very strong case to be made for fuller faculty participation in university governance. It seems to me there are problems in that respect. One is the current trend toward emphasizing implementation of managerial techniques borrowed from business in the administration of higher education. That tends to create a hierarchical pattern, not allowing much voice for people at the bottom of what is perceived a hierarchy.

The other problem is the preoccupation of the faculty members themselves. This is so much an age of specialization that most faculty members are narrowly focused and preoccupied with their own professional careers in their own professional fields. They want to devote all their time to their own speciality, improving their own efficiency and enhancing their own reputations in that field. They don't want to be bothered for the most part with participating in faculty governance. It is tough to get increased faculty participation in university governance. On the other hand, if we don't get it, it seems to me that unionization or pressures toward it are inevitable. A lot of increased incentive among faculty members around the state for unionization results from the failure of faculty salaries and compensation in general to keep pace with inflation. This seems to me to be one of the toughest problems the Coordinating Board is going to face in the 1980s. Can you get increased faculty participation in university governance or are you going to face up to the problems that go with unionization?

6. Funding by Formula

We support formula funding as a means of allocating state funds among institutions of higher education, but we urge the Coordinating Board: (1) to preserve maximum discretion for each institution in final allocation of funds received; (2) to continue efforts to counteract the tendency of formula financing to encourage unwarranted expansion of programs, especially at the graduate level; and (3) to seek ways to reward quality in programs rather than relying so largely on quantitative measurements in allocating funds.

7. Clarifying Each Institution's Role and Scope

The Coordinating Board should do all within its power to encourage each institution to strive for excellence within its own role and scope, as well as to develop specialties peculiarly adapted to that institution. Both to avoid unnecessary expenditures and to weed out weak programs, we urge the Coordinating Board: (1) to intensify its efforts to eliminate weak programs which are competing with superior programs at other Texas institutions, provided that the strong programs are adequate to meet demand; and (2) to prevent establishment of new programs unless it is clearly demonstrated that programs elsewhere in the state cannot meet the need. Recognizing the dangers of concentrating excessive power in the Coordinating Board and of inhibiting creative response at the local level, we nevertheless believe that governing boards of particular institutions have sometimes failed to make decisions with reference to the interests of the state as a whole. Consequently, we encourage the Coordinating Board to exercise its authority to assure that actions of individual institutions are consistent with the best interests of the state.

8. Increasing Financial Aid for Students in Public and Private Colleges and Universities

Because tuition and other expenses of attending higher educational institutions are bound to increase substantially, the Coordinating Board should seek steady expansion in sums provided for student financial aid so that Texans able to benefit both themselves and the State of Texas by attending college will not be barred from doing so by considerations of cost. Further, to continue our comprehensive and varied total offerings in the state, the Coordinating Board should continue to provide Tuition Equalization Grants to students attending fully accredited private colleges and universities.

9. Improving the Quality of Teaching

Imitating progressive business corporations, the Coordinating Board should promote programs of professional development for faculty members in order to help them do their jobs better. Again this relates to a point that Dr. Bishop was making this morning. The faculties at our institutions are increasingly older faculties--faculties with a relatively high age level. There is not so much infusion of young blood as there used to be. The haze of technological development has not slowed down any. The point is that in these circumstances it is especially important to provide programs of faculty development, to provide sabbatical leaves, to provide specialized training programs of one kind or another, to provide opportunities for the faculty member to catch up on the knowledge explosion in their particular area. We need to have that done so that these faculty can be competent to train the people who are converting from blue-collar to white-coat jobs or who are filling the increasingly technological job needs of our economy.

Specifically, the Coordinating Board should seek state funding for developmental leaves, for expanded service by teaching effectiveness centers, for faculty exchange programs, and for other programs designed to enhance the faculty member's professional experience and performance. In this context, the Board should continue to meet its legislatively assigned responsibility to protect academic freedom on Texas colleges and universities.

Thank you very much.

THE BALANCE BETWEEN GENERAL AND VOCATIONAL EDUCATION

by Doris Burbank*

Madam Chairman and members of the Board, I appear today on behalf of the almost 5,000 members of the Texas Junior College Teachers Association, representing teachers in every academic and vocational/technical discipline from every two-year college campus in our state.

Madam Chairman, we, of course, share the deep concerns that Dr. White has outlined in the joint statement. We feel compelled to expand a bit in one area mentioned in the statement, because that area is one which is deeply important--indeed critical--to our state's community junior colleges. I refer to item two in the joint statement: "Assuring Balan e Between General and Vocational Education."

Let me emphasize that our organization has supported, for the past 17 years, movements to encourage two-year colleges to become truly comprehensive community colleges. We are proud of the excellent programs in occupational and technical education offered at community junior colleges throughout the state. We do not intend to disparage those programs or diminish in any way the tremendous contributions they have made, and continue to make, in the lives and careers of students and in the advancement of our state's industry and technology.

We are concerned about the matter of balance, however. We are troubled from time to time when we hear statements to the effect that community junior colleges should be limited in their purpose to providing technical and vocational education. Quite clearly, such a limited purpose was never intended by the Legislature or by the people of the 47 public community junior college districts when their institutions were created. On the contrary, in the statutes and in the establishment of every community junior colelge, there can be found the explicit and consistent commitment to the provision of freshman and sophomore level courses for the first two years of baccalaureate degree programs as well as programs in technical and vocational education.

We wholeheartedly agree that a major purpose of education is to equip our students with skills to make them "employable" as economically productive members of society. But we believe with equal fervor that our state's schools and colleges have an equally demanding responsibility to help prepare our students to be good citizens--in the broadest sense of the term. A college curriculum designed to produce technicians is contributing only narrowly to the deeper and fuller purposes of education. It avails little when we train a student to make a good living, if we neglect to help that student make a good life.

---

* Doris Burbank is president of the Texas Junior College Teachers Association. This statement was presented to the Coordinating Board June 19, 1980 in Arlington.

Great philosophers and great statesmen down through the ages have commented on the importance of broad enlightenment and general education. Most of us are where we are today not because we developed skills in a single narrow area of endeavor, but because we developed also an understanding of our relationships with others and of our obligations to contribute meaningfully to improve the quality of life for others in our families, in our neighborhoods and communities and in our state.

Madam Chairman, in the final analysis, the issue becomes a matter of values. If our state values the development of fine technicians, highly trained and skilled in narrowly limited aspects of production, who lack the capacity to relate their knowledge to large and complex social and economic issues, then perhaps the curricula of our colleges should--as in the Soviet Union--provide specialized knowledge in specialized institutes for specialized technological purposes.

We believe, though, and we are confident that members of the Coordinating Board and your staff will agree, that broad, general education is indispensable to effective self-government; and that general education is the key which opens doors to personal growth and fulfillment, individual success and an enlightened society.

We urge, therefore, as you contemplate the issues confronting our state's system of higher education during the coming decade, that you move to preserve the legitimate role of our colleges and universities in imparting to our students not only the skills to become expert technicians, but also the wisdom and understanding to appreciate their heritage, to contribute to the quality of the lives of others and to become constructive family members and citizens of our society.

PART III

Staff Working Papers

PUBLIC HIGHER EDUCATION FINANCE

The decade of the '70s brought a number of changes to higher education in Texas and the nation. The rapid expansion which characterized the '60s continued into the next decade with the establishment of eight public senior colleges, one public medical school and seven community college districts across the state. Enrollments in public higher education increased by 66 percent in the 1970s.

Appropriations to higher education increased from $898.5 million in the 1970-71 biennium to $3.4 billion for the 1980-81 biennium, an overall increase for all sectors of public higher education of 283 percent. The Texas system of higher education is the third largest in the United States, following New York and California. The level of appropriations to public higher education also ranks Texas third in the nation.

The growth rate for higher education began to slow in 1977, with six public universities showing a decline in enrollment. By 1979, 19 university campuses out of 37 experienced declining enrollments. A new era emerged, with management for growth changing to management of enrollment decline or enrollment stabilization. This change presented universities with several problems. Of primary concern was the effect of enrollment decline on appropriations, since a substantial portion of institutional funding is based on enrollment-driven formulas. Faced with the possibility of declining appropriations, several universities began to evaluate their inventory of degree programs for the purpose of reducing faculty and administrators.

Such changes were not unique to Texas, and the problem in several other states was complicated by a slowdown in the growth of state revenue for appropriation purposes. Priorities for state funding also changed as needs increased for greater funding for human resources, correctional institutions, highways and elementary and secondary education.

In addition, inflation and the energy shortage impacted on appropriations to public higher education. In 1970, the inflation rate was 5.1 percent, and by 1979 the rate had increased to 13.3 percent. In 1973, the country began to realize the threat from the declining production of oil and gas in the United States through drastic increases in prices for natural gas and imported oil. Colleges and universities in Texas were spending 4.29 percent of their appropriations for utilities in 1970. By 1979, utility costs consumed 12.57 percent of their appropriations. Appropriations for utilities now rank as the second largest funding item for public senior colleges and universities. The utilities appropriation was close to $10.7 million for 1970, increasing to almost $100 million in 1980 for public senior colleges and universities. The growing cost for utilities could potentially threaten the maintenance of quality instructional programs at the colleges and universities if revenues available for appropriation become limited and the cost of utilities continues to increase at the same rate for the '80s.

Projecting Higher Education Appropriations

Projecting appropriations through five biennia is a difficult task

under the best conditions. The nation last year experienced unusually high inflation, which continued into 1980. The August Consumer Price Index showed an annual inflation rate of 12.7 percent. The highest level through the first eight months of 1980 was 14.4 percent. In addition, state revenues will be affected both negatively and positively by such factors as inflation, deregulation of oil and gas and the movement of business and industry from the North into Texas.

The 1990-91 appropriations projections are based on the following assumptions: (1) statewide enrollments in higher education will continue to increase, but at a slower rate than that experienced in the '70s; (2) there will be no change in the number of public colleges and universities; (3) total state appropriations will continue to increase through most of the '80s at a rate slightly lower than that of the previous decade; (4) significant increases in appropriations to higher education will be necessary because of rising energy prices and the need for major repair and rehabilitation of educational facilities for extended usefulness and energy efficiency; (5) appropriations will be available to provide for new construction at universities not participating in the Permanent University Fund; and (6) general revenue funds will be used to overcome the loss of federal revenue sharing funds in higher education appropriations.

The 1980-81 biennial appropriations were used as a base to develop a range of projections for public higher education appropriations in the 1990-91 biennium. The higher of the two projections shows an increase in appropriations of 120 percent or $4.1 billion for 1990-91 over 1980-81. The other indicates an increase of 103 percent or $3.5 billion.

High Projection

Projected Appropriations for 1990-91 Biennium Compared With Legislative Appropriations for 1980-81 Biennium

All Agencies of Higher Education

Biennium	Public Colleges and Universities	Public Junior Colleges	Health-Related Agencies	All Other	Total
1990-91	$3,571,108,000	$1,139,715,000	$1,975,507,000	$911,772,000	$7,598,102,000
1980-81	1,594,145,215	491,978,162	929,389,695	431,262,639	3,446,775,711
Percentage Increase	124%	131%	112%	111%	120%

In the 10-year period, the high projection indicates appropriations to public senior colleges and universities would increase by $1.9 billion; to public junior colleges, by over $647 million; to health-related agencies, by $1 billion; and to all other agencies of higher education, by $480 million.

Low Projection

Projected Appropriations for 1990-91 Biennium Compared With Legislative Appropriations for 1980-81 Biennium

All Agencies of Higher Education

Biennium	Public Colleges and Universities	Public Junior Colleges	Health-Related Agencies	All Other	Total
1990-91	$3,284,393,000	$1,048,210,000	$1,816,898,000	$838,568,000	$6,998,069,000
1980-81	1,594,145,215	491,978,162	929,389,695	431,262,639	3,446,775,711
Percentage Increase	106%	113%	95%	94%	103%

The low projections show an increase of $1.6 billion in appropriations to public senior colleges and universities, of $556 million to public junior colleges, of $887 million to health-related agencies and of $407 million to all other agencies of higher education.

Still other projections could be made. One should be included merely to illustrate the impact of inflation alone. Bankers know that $\underline{y}$ to the .072 power times 10 years is 100 percent. An inflation rate of 7.2 percent would require a biennial appropriation for 1990-91 of $6.8 billion for higher education if our colleges were to be maintained at the same level they are today. An inflation rate of 10 percent would require a biennial appropriation in excess of $8.5 billion within another decade to stay at the real dollar level where we are today.

The cost of higher education to the state will continue to increase during the '80s because of the growth in enrollments--albeit modest--and increases in prices to operate the universities. Certain alternatives may be considered for reducing the funding requirements; their effectiveness may be limited, however, because of the number of students continuing in higher education and certain fixed costs in campus operation.

College and university campuses can absorb more students by offering courses in the afternoon and evening hours and on weekends as an alternative to constructing additional facilities.

Off-campus courses should be eliminated, perhaps causing enrollments on the main campus to increase, and funds used to operate off-campus programs could be applied to main-campus educational programs. Such reallocation of funds would strengthen the educational programs on campus and improve the quality of instruction. Off-campus courses are being offered in some locations within commuting distance of a campus. These courses operate in leased facilities, and the enrollments generate the same amount of state funding as on-campus courses.

The incentive to offer off-campus courses could be reduced by developing

lower funding rates for such courses. This procedure could affect certain main-campus operations of institutions with large off-campus enrollments, because income above costs generated by the off-campus enrollments is supporting on-campus programs.

Program evaluations leading to approval of requests for new degree programs could be strengthened. With enrollments growing more slowly, careful consideration should be given to the ability of the universities to support new graduate programs and whether the new programs would be a duplication of other programs in the state.

Consideration could be given to merger of certain senior universities within close proximity. Savings to the state could be realized only if the campus of one of the merged institutions was closed, thus reducing appropriations for physical plant operations and maintenance. This alternative is useful only if one institution has the facilities to accommodate the increased enrollment from the merger. If there is outstanding bonded indebtedness on the closed campus, either the state or the university that is reorganized through the merger would have to assume the obligation.

General revenue fund appropriation could be reduced by increasing university tuition and fees. Public community junior colleges could also increase tuition and fees, as well as use more of their local taxes for instructional purposes.

Public Senior Colleges and Universities

Under Section 61.059 of the Texas Education Code, the Coordinating Board is charged with the responsibility to ". . .devise, establish, periodically review and may revise formulas for the use of the Governor and Legislative Budget Board in making appropriations recommendations to the Legislature." Through advisory committees, the Board reviews, modifies and designates formulas biennially to be used in the appropriations process. The formula system has evolved slowly over the past 25 years through careful study, testing by the Coordinating Board and acceptance by the legislature. In 1959, there were five formulas; in 1967, there were seven; and in 1979, 11 formulas were used in the appropriations process. Twelve formulas were designated by the Board in 1980 for use in making appropriations for the 1982-83 biennium.

Table 1 shows the changes in appropriations to public senior colleges and universities by contrasting fiscal year 1970 with fiscal year 1980 formula and nonformula appropriations. In 1970, the formula elements generated 89.2 percent of the total appropriations to public senior colleges and universities; the nonformula elements, 10.8 percent. Ten years later the ratio had shifted to 76.1 percent for formula items and 23.9 percent for nonformula items.

Several factors account for the percentage shift between formula and nonformula elements. Substantial increases in nonformula appropriations for utilities, major repairs and rehabilitation and special items were a major factor in reducing the percentage of total funding generated by the formulas. The 1980 utilities appropriation increased 828 percent over 1970 and now constitutes over 12 percent of the total appropriations. Appropriations for major repair and rehabilitation are 490 percent higher in 1980 than 1970.

Table 1

Appropriations to Public Senior Colleges and Universities

1970 and 1980

Elements of Cost	1970	% of Total	1980	% of Total
Formula Elements				
General Administration and Student Services	$ 17,163,365	6.88%	$ 50,507,363	6.40%
General Institutional Expense	3,311,334	1.33	10,805,157	1.37
Faculty Salaries	130,608,280	52.37	332,195,020	42.08
Departmental Operating Expense	26,224,373	10.51	72,810,233	9.22
Instructional Administration	3,968,353	1.59	17,418,955	2.21
Library	14,333,866	5.75	37,358,857	4.73
Organized Research	6,760,578	2.71	7,163,386	0.91
Physical Plant General Service	4,466,202	1.79	13,453,778	1.71
Building Maintenance	7,405,690	2.97	26,349,433	3.34
Custodial Services	6,407,149	2.57	22,600,591	2.86
Grounds Maintenance	1,932,907	0.77	9,802,291	1.24
Subtotal	$222,582,097		$600,465,064	
% of Total Appropriation	89.2%		76.1%	
Nonformula Elements				
Staff Benefits	$ ---	---%	$ 15,780,849	2.00%
Organized Activities	1,550,269	0.62	4,270,718	0.54
Vocational Teacher Training	234,023	0.09	613,214	0.08
Extension and Public Service	1,447,958	0.58	2,696,595	0.34
Campus Security	---	---	8,619,274	1.09
Utilities	10,691,840	4.29	99,258,599	12.57
Special Items	7,125,230	2.86	23,544,021	2.98
Major Repairs and Rehabilitation	5,784,910	2.32	34,152,559	4.33
Subtotal	$ 26,834,230		$188,935,829	
% of Total Appropriation	10.8%		23.9%	
Total	$249,416,327		$789,400,893	

Funding for special items, which includes new construction, increased by 230 percent. Also, in 1980 the percentage of the total appropriations for faculty salaries, departmental operating expense, library and organized research declined significantly in contrast to their percentages of the total 1970 appropriations. These four areas are important to the overall quality of higher education.

The percentage of total state appropriations for higher education has fluctuated in the past decade. In 1978, higher education received 19.1 percent of the total state appropriations; the percentage declined to 17.4 percent in 1981 appropriations. The biennial increases for higher education varied, reaching a high of $773 million in the 1976-77 biennium over the previous biennium. The 1980-81 biennial increase was $556 million. The contrasting percentage increases also show 1976-77 as a high point, with a 51.3-percent increase in appropriations over the 1974-75 biennium. The percentage increase declined to 19.3 percent in the 1980-81 biennium.

Total state appropriations have increased from $5.8 billion in the 1970-71 biennium to $20 billion in the 1980-81 biennium, up 245 percent. Higher education appropriations for the same period increased 284 percent. The rate of increase in total state appropriations for the past two biennia has remained almost constant, growing by 28.5 percent in 1978-79 and 28.8 percent in 1980-81.

Public Community Junior Colleges

The Texas system of community junior colleges encompasses 47 districts. The colleges are authorized to offer a two-year comprehensive educational program in academic, vocational-technical training, adult and compensatory education. The districts receive state appropriations for the cost of administrative and instructional programs. Campus facilities are constructed, operated and maintained by local district tax revenues. In effect, there is a state and local partnership in the operation of public community junior colleges in which the district maintains a high level of autonomy with elected boards of trustees to govern the districts.

Community college enrollments increased significantly in the '70s, rising from 108,023 in 1970, or 31 percent of the total public higher education enrollment, to 239,136 in 1979, or 41 percent of the total public higher education enrollment. State appropriations constituted approximately 62 percent of public community college expenditures in 1970, increasing to 66 percent in 1979.

Public community junior college state appropriations can be expended only for certain elements of cost: general administration and student services, general institutional expense, faculty salaries, departmental operating expense, instructional administration, library, organized activities and staff benefits. All other elements of cost must be paid from sources of revenue other than state appropriations.

Table 2 summarizes the expenditures for all districts by element of cost for fiscal years 1970 and 1979 to show the change in levels of expenditures during the '70s. Total expenditures have increased from $74,325,432 in fiscal 1970 to $346,078,341 in 1979, a 366-percent increase. Table 2 also shows that

Table 2

Educational and General Expenditures
Public Community Junior Colleges

Fiscal Years 1970 and 1979

Elements of Cost	Total Expenditures All Districts 1970[1]	Total Expenditures All Districts 1979[2]	Percent Change
General Administration and Student Services	$ 9,428,781	$ 49,909,612	429.3%
General Institutional Expense	4,883,789	11,066,980	126.6
Staff Benefits	---	13,181,991	---
Resident Instruction	(46,592,522)	(176,766,185)	(279.4)
General Academic Courses	(31,745,560)	(93,909,022)	(195.8)
Faculty Salaries	26,183,486	75,792,497	189.5
Departmental Operating Expense	3,497,456	11,416,879	226.4
Instructional Administration	1,521,682	6,370,787	318.7
Organized Activities	542,936	328,859	- 39.4
Vocational-Technical Courses	(14,846,962)	(82,857,163)	(458.1)
Faculty Salaries	7,745,988	56,243,508	626.1
Departmental Operating Expense	5,527,824	19,606,317	254.7
Instructional Administration	1,250,925	6,805,484	444.0
Organized Activities	322,225	201,854	- 37.4
Library	3,786,662	17,201,633	354.3
Organized Research	264,082	49,237	- 81.4
Extension and Public Service	328,153	9,875,861	2,909.5
Physical Plant Operation and Maintenance	(8,374,987)	(43,112,3[illegible]7)	(414.8)
Physical Plant General Services	1,665,738	6,510,719	290.9
Campus Security	---	3,085,542	---
Building Maintenance	1,588,831	7,349,626	362.6
Custodial Services	2,348,662	9,560,756	307.1
Grounds Maintenance	733,830	3,041,401	314.5
Utilities	2,037,926	13,564,303	565.6
Special Items	310,721	22,662,582	7,193.5
Major Repairs and Rehabilitation	355,735	2,251,913	533.0
Grand Total	$ 74,325,432	$346,078,341	365.6%

1/ Includes 40 districts
2/ Includes 47 districts

physical plant operation and maintenance costs have increased from $8,374,987 in 1970 to $43,112,347 in 1979, a 415-percent increase. Certainly some of the cost can be attributed to new districts, campus expansion and inflation. The largest percentage change for the districts was in utilities, with expenditures increasing by 565 percent since 1970.

Table 3 shows changes in the levels of educational and general income to public community colleges.

In 1970, state appropriations constituted approximately 55.2 percent of the total educational and general income for all districts. By 1979, state appropriations made up 62.5 percent of the total educational and general income for all districts. An analysis of the impact of state appropriations on expenditures for the eligible elements of cost in 1970 shows that state appropriations covered 71.6 percent of the eligible costs to all districts. By 1979, state appropriations covered 84.8 percent of the eligible costs for all districts in administrative and instructional programs. The remainder was paid for out of other sources of revenue.

Off-Campus Course Offerings

As noted earlier, the state's public colleges and universities also receive appropriations for off-campus resident credit course offerings, with no differentiation in funding rates for on-campus and off-campus course activity. The total biennial appropriation for off-campus courses for public senior colleges and universities and the out-of-district academic programs offered by community junior colleges was approximately $17.2 million in fiscal 1980 and $18.1 million in 1981.

In fiscal 1980, the off-campus enrollments increased appropriations to the public senior colleges by $11,468,731 and for fiscal 1981 by $12,040,888. The amount of funding per university ranged from $7,098 to $2,569,393 for fiscal 1980. In some instances the appropriations amounted to 10 to 15 percent of formula funding.

Community college out-of-district enrollments accounted for 5.1 percent of the total academic contact hour enrollment for the 1978-79 school year. The 3,045,643 contact hours out of a total of 59,329,497 increased the appropriations for academic programs by $5.8 million in fiscal 1980 and $6.1 million in fiscal 1981.

In 1975 the legislature extended the Coordinating Board's authority to approve off-campus course offerings by the public senior colleges and universities. The Board's authority up to that time had been limited to review of out-of-district offerings by public community colleges. Guidelines approved by the Board to regulate off-campus course activity were directed toward quality control to ensure that the courses would be comparable to on-campus offerings. The effect of the regulations has been to reduce substantially the number of courses offered off campus. In 1977, the number of courses offered was 3,880; in 1980, the number of courses approved to be offered was 2,917, a decrease of 25 percent. Several universities experienced enrollment decline when their off-campus course offerings were reduced.

Table 3

Educational and General Income
Public Community Junior Colleges

Fiscal Year 1970 and 1979

Source of Income	Fiscal 1970[1/]	Fiscal 1979[2/]	Percent Change
State Funds	$(46,318,971)	$(227,445,917)	(391.0%)
State Appropriations for C.B. approved academic courses	35,108,600	124,253,639	253.9
Funds received from Texas Education Agency	10,875,059	98,246,473	803.4
Other Income	335,312	4,945,805	1,375.0
Federal Funds	2,027,978	22,164,736	992.9
Local Funds	(35,520,818)	(114,396,763)	(222.1)
Tuition and Fees	(14,580,901)	(44,898,130)	(207.9)
Tuition	12,599,237	31,908,187	153.3
Laboratory and Other Fees	1,981,664	12,989,943	555.5
Taxes			
Taxes for Current Operations	18,738,969	49,610,194	164.7
Other Income	2,200,948	19,888,439	803.6
Total Educational and General Income	$ 83,867,767	$ 364,007,416	334.0%

1/ Includes 40 districts
2/ Includes 47 districts

Table 4 shows the percentages of off-campus semester credit hour enrollments by institutions and level for the public senior colleges. The data are for the summer 1978, fall 1978 and spring 1979 semesters. While the total semester credit hours of off-campus course work is 1.68 percent of the total semester credit hours of enrollment for all senior colleges and universities in the public sector, the institutional range is from less than one percent to 12 percent. Graduate course offerings reflect the highest semester credit hour enrollment, ranging from less than one percent to almost 45 percent of one institution's graduate enrollment. The percentage of total graduate semester credit hour enrollment generated by off-campus activity is 7.33 percent. Of the 30 universities offering off-campus graduate courses, 13 are above the 7.33-percent level.

It appears that several universities have become so deeply involved with off-campus course operations that a change in the guidelines regulating off-campus course approvals or substantial disapprovals by the Coordinating Board in course offerings could significantly reduce their appropriations.

While it must be acknowledged that a certain amount of off-campus course offerings is necessary, it is also obvious that certain universities have overly committed themselves to the point that they are dependent on off-campus courses, not only for enrollment but also for dollars to operate the main campus.

Table 4

Off-Campus Semester Credit Hour Production,
By Percentages

TEXAS PUBLIC SENIOR COLLEGES AND UNIVERSITIES

	Undergraduate	Graduate	TOTAL
East Texas State University	3.25%	36.64%	12.13%
East Texas State University Center at Texarkana	.76	3.73	1.94
Lamar University	.23	5.71	.49
Lamar University at Orange	---	---	---
Lamar University at Port Arthur	---	---	---
Midwestern State University	.64	1.18	.66
North Texas State University	.25	15.89	2.95
Pan American University	4.92	3.88	4.87
Pan American U. at Brownsville	12.33	11.40	12.09
Stephen F. Austin State University	.54	31.18	3.36
Texas A&M University System			
Moody College	---	---	---
Prairie View A&M University	.90	44.89	8.09
Tarleton State University	1.95	18.94	3.59
Texas A&M University*	.07	1.38	.24
Texas Southern University*	---	---	---
Texas State University System			
Angelo State University	1.64	1.48	1.64
Sam Houston State University	.79	15.73	1.98
Southwest Texas State University	2.10	10.12	2.57
Sul Ross State University	---	1.93	.33
Uvalde Study Center	---	---	---
Texas Tech University*	.01	.74	.08
Texas Woman's University	.72	5.60	2.04
The University of Texas System			
The U. of Texas at Arlington	---	1.06	.11
The U. of Texas at Austin*	---	.05	.01
The U. of Texas at Dallas	.004	.76	.25
The U. of Texas at El Paso	1.69	7.54	1.98
The U. of Texas of the Permian Basin	.82	8.40	2.31
The U. of Texas at San Antonio	.77	5.01	1.26
The U. of Texas at Tyler	2.18	10.92	4.00
University of Houston System			
Central Campus*	.10	2.58	.61
Downtown College	---	---	---
Clear Lake City	3.68	2.93	3.35
Center at Victoria	1.03	13.71	5.72
University System of South Texas			
Corpus Christi State University	.16	.24	.18
Laredo State University	2.73	---	2.18
Texas A&I University	5.64	12.45	6.35
West Texas State University	.47	6.52	1.03
TOTALS	.81%	7.33%	1.68%

*Graduate total includes special professional semester credit hours.

STATEWIDE PLANNING FOR CAMPUS CONSTRUCTION

After almost two decades of a building boom in higher education, forecasts for the 1980s are almost uniform in their prediction of declining or, at best, leveling enrollments nationwide. Even those regions benefiting from a favorable climate, a healthy economy, or both, may partially escape the projected downturn because of resulting in-migration patterns. But an enrollment plateau is the best that can reasonably be expected in most states, including Texas.

Signs of the predicted trend already have begun to appear. Enrollments at Texas colleges and universities are expected to increase by less than one percent annually through 1990. Without rising enrollments, there is no longer a need for more square feet of higher education facilities, except at a few persistently under-built campuses. Therefore, the need for new construction in the '80s in all likelihood will be limited to the more selective needs for highly specialized space, along with the major renovation and/or conversion of existing facilities. The amount of funding needed for essential repair and remodeling, which may have been somewhat ignored in past years due to the momentum of new construction efforts, could equal or even surpass the historical dollar volume of new construction.

The current constitutional devices for funding new construction, the Permanent University Fund and the Ad Valorem College Construction Fund, were designed respectively to meet the extreme needs of establishing a state university (i.e., The University of Texas, plus subsequently, Texas A&M University) and to provide the smaller state colleges with sufficient facilities for handling burgeoning enrollments in the post-World War II era.

The original impetus of new construction has waned, however, and no anticipated trends will support its resurgence in the foreseeable future. Even if a pronounced but less urgent demand for additional building space were evident in the next decade, other factors which were previously much less significant must now be taken into account in capital investment decisions.

Planning for Efficient Campus Development

Physical plant development clearly must be more responsive to academic and financial planning. Realistic planning of physical space brought about by pressures from outside the academic world can only be made in the context of anticipated changes in academic planning. Physical planning for space must be flexible in order to accommodate changing program requirements. To meet this need, institutions must develop effective techniques for space management. This should include inventorying space, analyzing space utilization, scheduling efficient room use, projecting how space should be used (realignment and remodeling) and planning when and how much additional space will be needed.

Buildings have two significant costs: the initial cost of construction and the ongoing cost of operation. The former is increasingly affected by economic inflation which is currently between 1 and 1.5 percent per month;

each year, indeed each month, a dollar buys relatively less building space. Operational costs include debt retirement, building custodial services and routine maintenance, major repair and rehabilitation and energy costs, an item which is rising dramatically (the current utility cost to Texas' public senior colleges is in excess of $100 million per year). Indeed, the very availability of adequate energy resources is increasingly in doubt. Operating costs continue for the life of a building. A commitment to each new square foot of space is inevitably a commitment to the expenditure of funds (currently approximately $5 per square foot per year for scheduled operating costs) for 30 years or longer.

Two important considerations that greatly affect space planning, both in daily operations and in short- and long-term planning, are (1) energy and (2) program accessibility for handicapped persons.

It is obviously more energy-efficient during the heating and cooling seasons to use as few facilities as possible over as short a period as possible to accommodate program requirements. In addition, if there is a choice of facilities to use for a given program, the more energy-efficient should be selected. Every space assignment should be viewed for its effect on energy consumption.

Proposed new construction projects and plans for remodeling should be evaluated with regard to budgetary impact of annual energy costs and other operating costs before a project is undertaken and when architectural designs are being accepted. Emphasis should be placed on designing facilities that are economical to operate, not just economical to build. Evaluation of operating or energy costs can sometimes result in recommendations to eliminate temporarily or permanently certain existing space.

Section 504 of the Rehabilitation Act of 1973, as amended, requires that all programs, activities and services be accessible to handicapped persons. Thus, no qualified handicapped student may be excluded from any program or course of study on the basis of handicap. To achieve program accessibility for all students, space managers must be innovative. Rescheduling of class locations is one means to assure accessibility and may also avoid or at least reduce the necessity to alter facilities. Preregistration of handicapped students also can be useful in rescheduling.

In the past, many buildings were constructed to support a "peak-load" concept of facilities need. That is, the whole day and the whole week were not the frame of reference for facilities use, but rather use was concentrated on blocks of time between 8 a.m. and 5 p.m., a time frame preferred by both students and professors. A recent study of facilities utilization by public senior colleges shows that current use is significantly below reasonable expectations for the use of public buildings. It found that the extended use of existing space from 8 a.m. until 10 p.m., five days a week, can alleviate peak-load pressure and supplant the demand for additional square feet of space.

The Shift from New Construction to Renovation

Because of these considerations--diminishing enrollment growth, increasing cost of new construction and need for improved utilization of existing space--the emphasis in facility planning must change from new construction to

other, more pressing facilities needs. The construction of additional space should become virtually an option of last resort after the most careful study of other alternatives.

The need for major renovation of existing buildings is rapidly replacing new construction as the top priority. The renovation of facilities also offers potential solutions to problems which in the past were solved by building additional square feet. As the momentum for new construction grew and the primary sources of funds were limited to this use, the condition and optimum usability of existing facilities often were overlooked. Consequently, even some of the buildings constructed during the building boom of the 1960s and 1970s have now deteriorated to such a point that their continued use will require major renovation. Conversion to new, more appropriate uses may be required in some cases. In addition, 35 percent of all public senior university buildings (i.e., approximately 25 million gross square feet) are over 20 years old, a fact which implicitly indicates a significant need for major repair and rehabilitation.

It is difficult to make valid inferences about overall renovation need on the basis of major repair and rehabilitation requests of past biennia. These requests are not related consistently to objective, comprehensive statewide criteria by which to assess uniformly the need for major repair and rehabilitation as such (i.e., legitimate Major Repair and Rehabilitation budget requests include such disparate items as energy monitoring systems and landscaping).

A 1979 estimate by the Council of Presidents indicated a need of $400 million to 1987 for major repairs and rehabilitation at the state's senior colleges and universities. Legislative requests of the senior institutions for major repair and rehabilitation of facilities have increased from $26.9 million in 1974-75 to $106.2 million for the 1980-81 biennium.

Because of the shifting emphasis from new construction to major repair, renovation and conversion of existing facilities, a precise, objective and quantitative assessment of the physical and monetary need for these types of construction is fundamental to sound planning. To this end, the Coordinating Board has proposed to the legislature that an independent study be conducted to determine the condition of all public senior university facilities. Such a survey would identify need on the basis of uniform criteria for satisfactory condition and optimal usability. It also would provide a basis for any future funding of this increasingly critical element of facilities need.

Discussion to this point has been concerned primarily with educational and general space, which is constructed with state funds. But a potential need in the auxiliary enterprise category* is emerging--namely for additional on-campus housing. It has been induced in part by some of the same economic factors already mentioned. Inflation in the cost of living and the relentless rise in energy costs are making it economically advantageous for a growing proportion of students to live on campus in university-owned housing. A

---

*An auxiliary enterprise is a facility which is managed as an essentially self-supporting activity, furnishing goods or services at a fee to students, faculty or staff; for example, residence halls, food services, certain inter-collegiate athletics and college stores (from College and University Business Administration, 3rd ed., 1974).

recent study evaluating the cost of gasoline versus the cost of room rental on campus indicated that a student living outside a 35-mile radius of the campus would find it more economical to live in university-owned housing. While there has been a nationwide trend back to dormitory living, in Texas the average occupancy rate for housing at public senior universities has not yet climbed and, in fact, fell from 89.3 percent in 1974 to 86.9 percent in 1978. Rates of occupancy at the 30 institutions surveyed ranged from a low of 44 percent, partly because of declining enrollments, to a high of 100 percent at four universities. There is normally a smaller penalty for having too few rather than too many residential facilities (i.e., vacant dormitory rooms may create serious financial difficulties, but having too little dormitory space, while inconvenient to students, imposes no financial burden on the school). So a natural tendency toward caution exists when the need for additional residence hall space is being projected. But this trend toward construction of additional housing would not necessarily be in conflict with prevailing constraints against new construction in general, in that auxiliary facilities are not built or operated with state funds, and are, if carefully planned to meet genuine need, self-amortizing through rental fees they generate.

Expansion of Media Technology

There is one more element of capital investment which, although not associated with physical space per se, is very closely related to the effective use of facilities in serving academic programs and research; i.e., the substantial increase in the use of media technology in education which has occurred in the last 20 years. The applications of this technology by colleges and universities have been well documented in numerous articles, including a series of papers in Planning for Higher Education. That report noted the various uses of electronic media by higher educational institutions, including a broad range of systems-computer assisted instruction, on- and off-campus television instruction, videocassette programs, amplified telephone programs and satellite-assisted programs.

The effective use of electronic teaching techniques will require an institution to determine which technology or combination of technologies will be best suited to its particular programs and objectives, and to equip its instructional areas for optimum utilization of those techniques. This determination must be carefully made, as many colleges and universities have found that their systems for media use no longer suit their program needs or teaching methods. These systems, however, are so permanently installed that total replacement would be the only solution. Since technology is changing continuously, care must be exercised to select the systems and equipment that will assure maximum flexibility over a period of years. With the federal government's withdrawing its funding of instructional equipment, states must insure funding for this necessary and costly category of higher education need.

In summary, an orderly transition must be carefully planned and effectively managed from an outdated commitment for more new facilities to remodeling and facilities-related needs which current and emerging circumstances have made critical to higher education in Texas. The new challenge provides an opportunity to develop creative solutions to a number of significant issues--the resolution of code and safety problems; the improvement of energy-wasteful conditions; the provision of accessibility for the

handicapped; the minimizing of costs for construction, maintenance and upkeep; and assuring the optimum utilization of buildings.

Appropriate data must be gathered and analyzed, and the conclusions they suggest must be carefully weighed to provide Texas with the very best higher education its tax dollars can buy.

NOTES

1979 Annual Report--Coordinating Board, Texas College System.

Woolf, Jack--Space Factors and Space Utilization Values for Use in Meeting the Facilities Needs of Texas Colleges and Universities.

Special Issue of the Society for College and University Planners--Planning for Higher Education. Winter, 1979, Vol. 8.

National Association of College and University Business Officers--Space Management. Administration Supplement, July 1978.

Planning and Management Systems Division, Western Interstate Commission for Higher Education. Higher Education Facilities Planning and Management Manuals.

Study Paper 26--Space Use Space Needs, A Study of the Availability and Use of Public Senior Higher Education Facilities in Texas.

ENERGY RESOURCES

In any consideration of the impact of the impending depletion of the state's energy resources, there appears to be little consensus. It is acknowledged that oil and gas production has begun to decline slightly in recent years, but no agreement exists as to how fast the decline will progress and what effect it may have on state revenue. Many believe that the rising prices of energy resources will offset the impact of the production slowdown, at least for the next 10 years and possibly even the next 20 years.

Projections for the next decade indicate a substantial growth in revenue from oil and gas taxes. Energy prices already have been increasing as a result of the 1973 Arab oil embargo, the 1978 deregulation of natural gas and the 1979 deregulation of domestic oil.

Consider, for example, projections from the U.S. Department of Treasury that Texas will reap $33.2 billion in state revenue from the decontrol of oil alone from 1980 through 1990. That estimate is based on increases in severance taxes, state oil royalties and local property taxes.

The Texas Energy and Natural Resources Advisory Council (TENRAC) estimates that $25.76 billion will be collected over the next 10 years in oil severance taxes. The State Comptroller's Office predicts the state will gain $8.5 billion in additional income from oil and gas severance taxes through 1990. An added $800 million is expected from oil royalties, and local governments are predicted to receive $3.8 billion more in property taxes as a result of decontrol.

Oil and gas production taxes constitute about 20 percent of the state's estimated tax revenue for the 1980 and 1981 fiscal years. Natural gas production tax collections have been estimated at $641.8 million for 1980 and $715.5 million for 1981. Taxes on oil production are estimated at $603.4 million for 1980 and $698.4 million in 1981, according to the Legislative Budget Board Fiscal Size Up of the 1980-81 biennium.

The price of oil is expected to continue its rapid increase through the end of the next fiscal year, with price decontrol to be completed by October 1981. Projections by DRI show that the average price per barrel of oil (in 1979 dollars) will increase by more than 40 percent from 1980 to 1981 (from $19.95 to $27.98), with an additional 19 percent increase (to $33.46) expected the following year. Revenue from gas production also is expected to increase substantially in the next few years.

As price projections through the end of the decade indicate, these increases will offset the declining levels of production. According to one oil company report, U.S. natural gas production has been declining since 1973 and is expected by the year 2000 to be at about half the 1973 level. Similarly, the nation's domestic oil production is reported to have peaked in the 1970s and continues to decline.

Charles Holt of the Bureau for Business Research at The University of Texas believes that the outlook is much more critical, predicting that the

state probably will run out of oil and gas by about 1990. He agrees that as oil and gas production declines, prices will increase, so the two trends will offset each other for a while. The Bureau has not made any actual revenue forecasts, however, and a TENRAC economist feels there is no validity to his prediction.

TENRAC estimates that oil production will decline 20 percent (from 2.47 million barrels per day in 1980 to 1.98 million barrels per day) by the year 2000. Gas production is projected to decline about 24 percent (falling from 6.70 trillion cubic feet in 1980 to 5.07 trillion cubic feet) in the next 20 years.

Most of the slowdown in oil production is expected to occur in the next two years, followed by a period of relatively stable production levels until about 1995. Decreasing gas production levels of about one to two percent annually are projected through the end of the century, although a slight temporary increase in production may occur at the beginning of the 1990s.

In short, by the year 2000 the price of oil is projected to be up by a factor of three, while production will be down by about one-fifth from 1980. Natural gas prices will be up by a factor of seven, with production down by a fourth, according to TENRAC.

Jim McGrew of the Texas Research League said oil and gas revenues are expected to begin dwindling by about 1990. The TRL has been asked by the Governor's Office to conduct an in-depth study of projected revenues from oil and gas taxes.

The governor's budget officer, Paul Wrotenbery, was quoted in the press last February as saying, "Oil and gas production is declining. Right now the price is coming up faster than production is coming down and higher prices may stimulate some more production, but eventually the curve will turn over. Our tax base will decline. What we're seeing now is some short-term relief."

In addition to the rise in state tax revenue, income from the Permanent University Fund, the permanent endowment of The University of Texas and Texas A&M University, also is expected to undergo a dramatic increase in the next 10 years. Its value, now estimated at $1.251 billion, is projected to rise to $3.251 billion by 1990, according to figures from The University of Texas System. That conservative projection is based on current production levels, with a price of $40 per barrel, generating a $200-million increase in value each year of the decade.

The projected increases would yield a corresponding growth in income to participating UT and A&M institutions from $82.1 million in 1980 to $231.63 million in 1990.

In the face of possible changes during the next legislative session in the structure of institutions sharing in the fund, this growth of the available fund also could have significant ramifications on statewide funding considerations for higher education.

NOTES

Cochran, Tom. The Effects of Rising State Severance Tax Revenues, 1980-1990. Washington, D.C.: Northeast-Midwest Institute, 1980.

Dallas Times Herald, 3 February 1980, p. 1.

Exxon Company. Energy Outlook: 1980-2000. Houston, 1979.

Institute of Higher Education Management, The University of Texas System. Conference Proceeding, The Texas Postsecondary Education Outlook: 1980-1985. Austin, 1979.

Legislative Budget Board. Fiscal Size Up: 1980-81 Biennium. Austin, 1980.